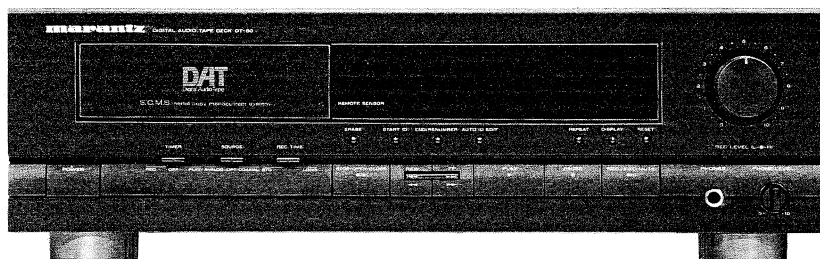


Service Manual

74 DT80/01B

Digital audio tape deck



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marantz®

model DT-80

First issue:

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MZ 2804

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ company has created the ultimate in stereo sound.

Only **original MARANTZ parts** can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ equipment are generally available to our National Marantz Subsidiary or Agent.

ORDERING PARTS:

Parts can be ordered either by mail or by telex. In both cases, correct part number has to be specified. The following information must be supplied to eliminate delays in processing your order:

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature: any order form or telex must be signed otherwise such part order will be considered as null and void.

PARTS ORDERING

Parts may be ordered at the following addresses:

AUSTRIA
HORNYPHON
Vertriebsgesellschaft GmbH
Wienerbergstrasse 1
A 1101 Wien
Austria
Telex: 132.332

BELGIUM
SVD DIVISION MARANTZ
Industrialaan 1
1720 Groot-Bijgaarden
Belgium
Telex: 24466

CHILE
MARANTZ
DIVISION OF PHILIPS S.A.
AV. Santa Maria, 0760
Casilla 2687
Santiago
Telex: 240.239

FRANCE
MARANTZ FRANCE
4 Rue Bernard Palissy
92600 Asnières
France
Telex: 611651

GERMANY
MARANTZ GERMANY GmbH
Alexanderstrasse 1
2000 Hamburg
Germany

THE NETHERLANDS
Elpro Marantz
Wint Hontlaan 28
3526 KV Utrecht
The Netherlands
Telex: 4748

GREAT BRITAIN
MARANTZ HiFi U.K. Ltd
Kingsbridge House
Padbury oaks
575-583 Bath Road
Long ford
Middlesex UB7 0EH
Faxnr.: 0753 680 428

GREECE
SHERTON ELECTRONICS S.A.
P.O.Box 21025
Hippocratus Street 188
Athens 11471
Greece
Telex: 216.795

JAPAN
MARANTZ JAPAN, Inc.
35-1, 7-chome, Sagamiono
Sagamihara-shi, Kanagawa
Japan

KUWAIT
AL ALAMIAH ELECTRONICS
Ussama Building
Fahd al Saleem Street
P.O.Box 23781
Safat-Kuwait
Telex: 22694

ITALY
MARANTZ ITALIANA S.P.A.
Via Chiese, 74
20126 Milano
Italy

SAUDI ARABIA
AL ALAMIAH ELECTRONICS
P.O.Box 5954
University Street
Riyadh 11432
Saudi Arabia
Telex: 401530

SOUTH AFRICA
MARANTZ
DIVISION OF PHILIPS S.A.
Main Road Martindale
P.O. Box. 58088
Newville 21114
South Africa

SPAIN
Euroservice S.A.
Bernardo obrégón, 26
28012 Madrid
faxnr.: 3412 306 198

SWITZERLAND
MARANTZ
Technischer Service
Duenstrasse 3
3186 Düringen
Switzerland

TURKEY
DOGRUOL Ltd.
I.M.C.
6 Blok N°6310
Unkapani
Istanbul
Turkey
Telex: 22085

MALTA
CACHIA & GALEA
Republic Street, 68D
Valetta
Telex: 1682

PORTUGAL
MARANTZ
Divisao philips S.A. service
Oturela-carnaxide
2795 LinDA-A-VELHA
Telex: 43906

MARANTZ INTERNATIONAL
Vestdijk 9
5600 MD Eindhoven
The Netherlands
Phone: +31/40.758290
Telefax: +31/40.75.82.99
Telex: 35000 PHTC NL routing IND NLMTFAT

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

In case of difficulties, do not hesitate to contact the Technical Department at abovementioned address.

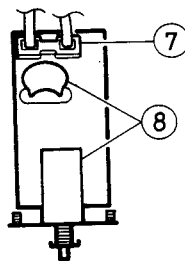
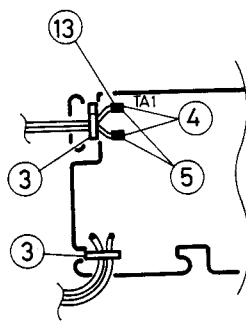
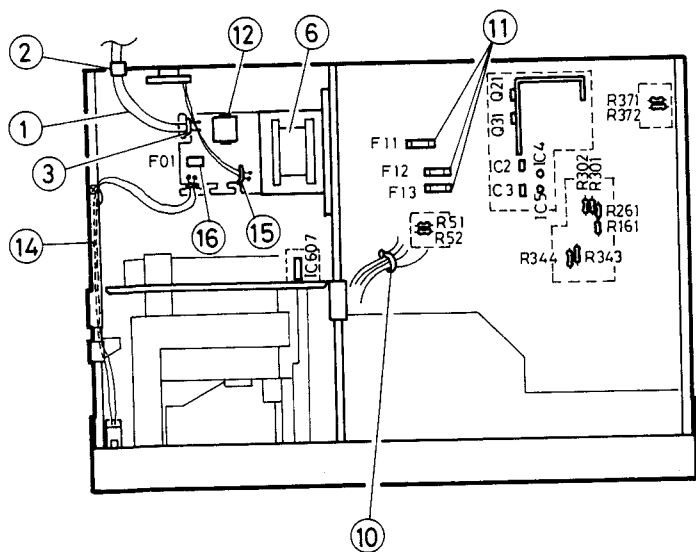
■ Important Management Points for Safety (Items Demanding Special Safety Precautions)

1. B: Confirm the power cord indications "BASEC" and "BS6500", and make sure that the core wire is free from any defect (scratch, etc.).
E/G: Confirm the cord indication "△VDE△" and plug indication "Ⓢ", and make sure that the cord is free from any defect.
2. Fix the power cord firmly with a strain relief device (after strain relief).
In this case, confirm the indication mark "4N-4", and fix the cord using the specified tool "HEYCO".
3. To prevent disconnection and erroneous touch, clamp the power cord and power switch wire firmly to the printed circuit board with bind.
4. To prevent coming-off, the power cords should be fixed to the terminal by soldering after twisting.
5. The power cords should be soldered after bundling together, and the space distance be 3.2 mm or more.
6. After confirming that the parts No. of power transformers B, E and G are respectively VTP66C9-012B, VTP66C9-012B and VTP66M9-011B, these transformers should be mounted firmly without any looseness.
7. Make sure that the connector has been inserted firmly and fully to the power switch printed circuit board.
8. Confirm the power switch mark "M7", and make sure that the spark killer condenser mark is "IE65" or "Ⓢ". Moreover, the terminal brazing should be free from any protrusion.
9. By no means should the heat parts (Q21 and Q31 including heat sinks IC2, IC3, IC4, IC5, IC607, LSI/Servo

- P.W.B., as well as R301, R302, R371, R372, R51, R52, R343, R344, R161 and R261) come into contact with any other parts.
10. The main P.W.B. connector wire should be clamped to separate the wire from the heat parts (R51 and R52).
 11. Confirm that the secondary fuse F11 is indicated by "Ⓢ" and "T1.25A", while the respective fuses F12 and F13 are marked by "Ⓢ" and "T1A". It should also be confirmed that the B model is marked by "◇". Moreover, make sure that the fuse labels F11 T1.25A and F12, F13 T1A are stucked on the printed circuit board.
 12. Confirm the line filter "ENZ5002".
 13. The core wire (BLUE) should be stucked on the T1A mark side.
 14. Make sure that the power switch relay wire is indentified by the double coating mark "∞" and a tube is inserted to prevent its contact with sharp edges.
 15. Confirm that the primary select switch is identified by a mark 203.
 16. Confirm that the primary fuse F01 is indicated by "Ⓢ" T500 mA/250 V, and the fuse F01 on the printed circuit board by "T500 mA".

B/E: To be marked
G : Not marked

E/B: To be marked
G : Not marked



ENGLISH

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FOREWORD

This section must be read before any connection is made to the mains supply.

WARNINGS

- Do not expose the equipment to rain or moisture.
- Do not remove the cover from the equipment.
- Do not push anything inside the equipment through the ventilation holes.
- Do not handle the mains lead with wet hands.

EQUIPMENT MAINS WORKING SETTING

Your Marantz product has been prepared to comply with the house-hold power and safety requirements that exist in your area. This product has a three position voltage selector (120V/220V/240V) on the rear panel. Check the mains working voltage setting on the model in your possession matches the mains voltage available in your area.

COPYRIGHT

Recording and playback of any material may require consent. For further information refer to the following:

- Copyright Act 1956
- Grammatic and Musical Performers Act 1958
- Performers Protection Acts 1963 and 1972
- any subsequent statutory enactments and orders.

FEATURES

1. Five 2-channel modes
 - 48 kHz mode: Sampling frequency of 48 kHz, 16-bit linear quantization
 - 44 kHz mode: Sampling frequency of 44.1 kHz, 16-bit linear quantization
 - 32 kHz mode: Sampling frequency of 32 kHz, 16-bit linear quantization
 - 32 kHz LP (Long Play) mode: Sampling frequency of 32 kHz, 12-bit non-linear quantization
 - 44 kHz WT (Wide Track, playback only) mode: Sampling frequency of 44.1 kHz, 16-bit linear quantization
2. SCMS (Serial Copy Management System)
 - Only one digital recording can be made of CD software
3. High-precision fine-tracking digital servo mechanism
 - Marantz's high-precision mechanism makes possible the LP Long Play mode
4. Fourth-order delta sigma type 1-bit ADC (Analog to Digital Converter)
5. 1-bit DAC (PEM DD converter)
6. AUTO ID EDIT function
 - The optimum START ID position is automatically shown in the display
7. Sampling monitor facility
 - 20-dot digital meter (with peak hold function)
8. 20-dot digital meter (with peak hold function)
 - The digital peak display shows the margin
9. Tray type cassette loading
10. Direct access playback with 10-key remote control (with Remover function)
11. Separate sub code keys
12. 10-key wireless remote control
13. Digital input/output terminals (Coaxial/Optical)
 - Meeting digital audio interface standards
14. SOURCE selector (Digital/Analog)

Types of DAT cassettes

Mode	Maximum recording time
Cassette	48k/44k/32k mode 32k-LP mode
R-120	2 hours 4 hours
R-90	1h.30 min. 3 hours
R-60	1 hour 2 hours
R-46	46 minutes 1h.32 min

Notes:

1. Cassettes recorded in the 32k-LP mode by this unit cannot be played back using DAT decks exclusively for the 48k or 32k mode.
The 44k-WT mode is used only when DAT prerecorded tapes made from master tapes by the contact printing process are played.
2. DAT: abbreviation of Digital Audio Tape
LP: abbreviation of Long Play
WT: abbreviation of Wide track

■ Instruction Book (Extraction)

REMOTE CONTROL SYSTEM

This is a convenient system which has been originated and developed by Marantz. Before starting operation, connect the remote cable as shown on page 8. The followings are the brief explanation of its major performances:

Automatic source Selection

When the provided remote cables are used for connecting this unit to other components which have REMOTE CONTROL terminals, the switch-over of all system components is possible with simple one-touch of the source selector button of Marantz's amplifier or receiver. By doing this, the corresponding component will start playing automatically.

The source select button of the remote control unit or the activation button of the desired components can be also used for this purpose. When the components have been switched over, the previous component will stop playing within 5 seconds.

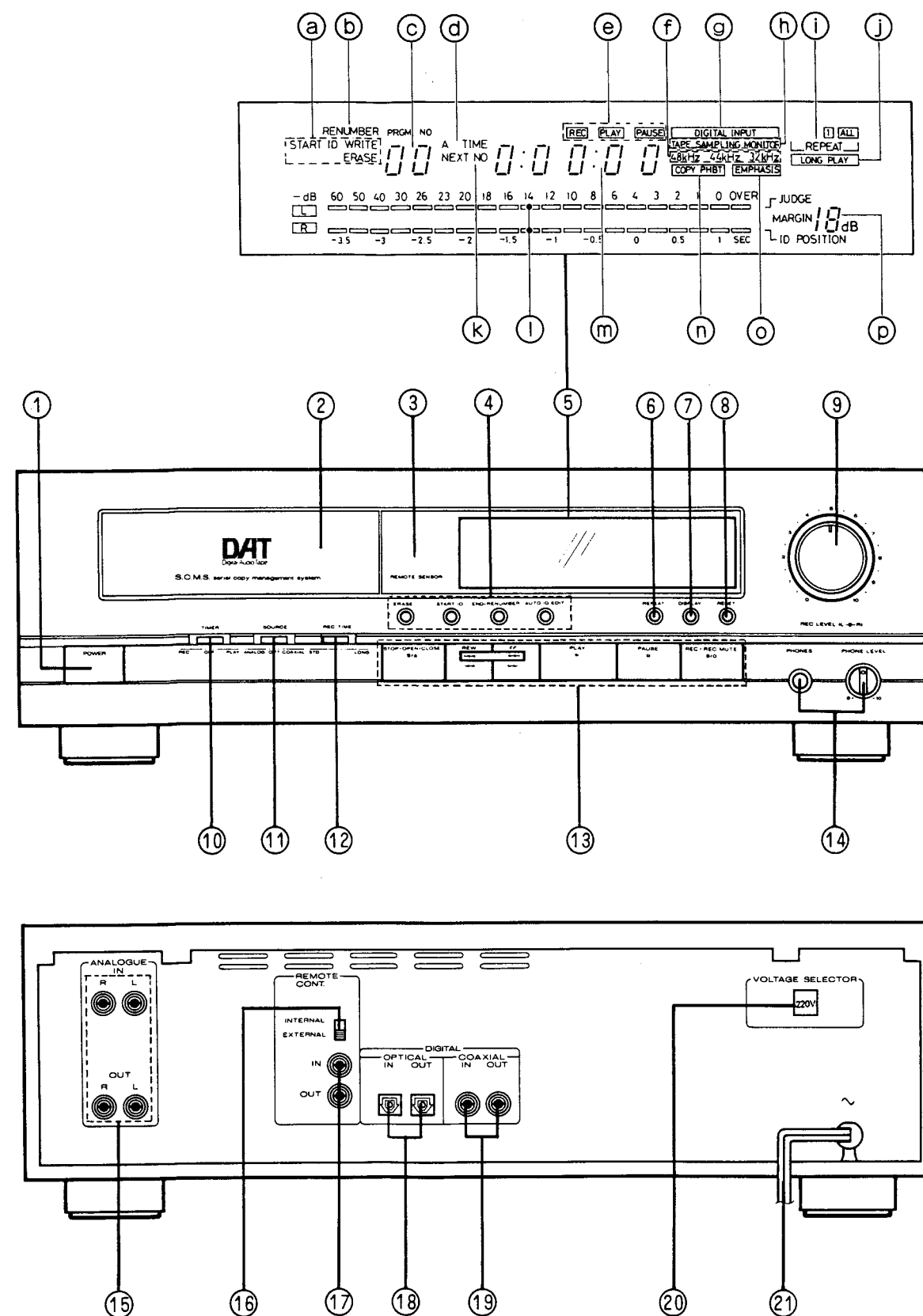
Synchronized Recording

Synchronized recording refers to the process in which the DAT deck starts recording in synchronism with the CD player.

Please study these instructions carefully before starting to operate the unit, to use the unit correctly. We take no responsibility for any problems resulting from misuse of this unit. It is operated by methods other than those given in this manual.

On operating this unit:

Since this unit incorporates a microprocessor which controls various functions, please read the description and cautions (notes) for each item carefully before use. If operated incorrectly, the required functions may not be performed. In this case, turn the power OFF then turn it ON again and see if correct operation has become possible.



NAMES OF PARTS AND THEIR FUNCTIONS

● Front panel

① POWER switch

② Cassette tray

③ REMOTE SENSOR

Receives infrared signals transmitted from the remote control unit.

④ Sub code buttons

● Start ID erase (ERASE)

● START ID

● END/RENUMBER

Press during recording to record the End code.

If pressed in the stop mode, it is possible to set new program numbers.

● AUTO ID EDIT

⑤ Display window

④ Start ID detect/memory/erase indicator

⑤ RENUMBER indicator

⑥ Program number indicator (PRGM NO)

⑦ Absolute time indicator (A TIME)

⑧ Mode indicator

⑨ Sampling frequency indicator

⑩ Digital input indicator (DIGITAL INPUT)

⑪ Tape/sampling monitor indicator (TAPE SAMPLING MONITOR)

⑫ REPEAT indicator

⑬ 32k-LP mode indicator

⑭ Next number indicator (NEXT NO)

⑮ Level meter indicators

⑯ Digital counter

⑰ Copy prohibit indicator (COPY PHBT)

⑱ Emphasis indicator (EMPHASIS)

⑲ Digital peak display

● When the following operations are performed, these indications are displayed.

TOP: When the deck is set to the rec-pause mode or rec mode at the beginning of tape.

-00:01: After TOP has been displayed and a tape is recorded and then rewound, this is displayed.

EE: When an End code is detected or recorded, the deck stops automatically and this is displayed.

no TAPE: When the cassette tray is closed without a cassette tape loaded.

⑥ REPEAT button

Used to repeat all the tunes on the tape.

⑦ DISPLAY button

Used to select the mode of the display.

When the power is first switched on, "A TIME" (absolute time) is displayed. Every time this button is pressed, the display alternates between the counter mode and "A TIME".

⑧ Tape counter reset button (RESET)

⑨ REC LEVEL control (Analog)

Adjust the recording level with this control.

The inner knob is for the left channel and the outer knob, the right channel.

⑩ TIMER switch

Used when timer recording or playback is to be performed using an audio timer. Normally set to the OFF position.

⑪ SOURCE switch

Set to according to the type of input signal. (Analog/optical/coaxial).

⑫ REC TIME switch

Select the recording time in different recording modes.

Recording mode	Analog recording	Digital recording	
Switch position			
Standard (STD)	48k mode	32k mode	48k/44k mode
LONG	32k-LP mode	32k-LP mode	

● The REC TIME switch is not used when recording a digital signal in the 48k and 44k modes. The source signal is recorded as it is.

⑬ Tape operations buttons

■ /▲ STOP/OPEN-CLOSE:

Press to stop the tape.

Press to open and close the cassette tray.

◀/▶ AUTO SEARCH:

Used to designate the number of tunes.

◀/▶ SEARCH:

When pressed in the stop mode, the fast-forward or rewind operation starts, and speeded-up sound can be heard at a lower level (cue, review function).

▶ PLAY:

Press to start recording and playback.

■ PAUSE:

Press to stop the tape temporarily.

To release this mode, press the ▶ PLAY button.

● REC/REC MUTE:

When recording, press the ▶ PLAY button while pressing this button. To enter the "rec-pause" mode, press together with the ■ PAUSE button. When this is pressed during recording, the rec mute operation is engaged.

⑭ PHONES jack and PHONES LEVEL control

● Rear panel

⑮ ANALOG (LINE) IN/OUT terminals

(Refer to page 8.)

⑯ REMOTE INTERNAL/EXTERNAL switch

Set this switch to INTERNAL when using this unit alone, and set to EXTERNAL when using this unit together with other component, which bears "■" logo and is equipped with a remote sensor, such as the Marantz amplifier.

⑰ REMOTE CONT. terminals

When connected to a CD player, cassette deck or amplifier with REMOTE CONT. terminals using the remote cable, synchro recording and automatic source selection are possible.

(Refer to page 8.)

⑱ DIGITAL OPTICAL IN/OUT terminals

Connect to an amplifier with optical digital in/out connectors using exclusive optical fiber cables.

⑲ DIGITAL COAXIAL IN/OUT terminals

Connect to an amplifier with coaxial digital in/out connectors using coaxial connecting cables (75 ohms).

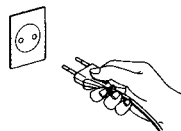
⑳ Voltage selector

㉑ AC cord

CAUTIONS

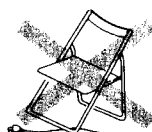
1. Safety hints

- 1) Be sure to pull the plug, not the cord. (Fig. 1)
- 2) Do not handle the power cord with wet hands.
- 3) Do not damage the power cord. (Fig. 2)
- 4) If the deck is not to be used for an extended period, unplug the power cord.
- 5) Do not remove the cabinet. To avoid electric shocks, do not touch parts inside the deck. Consult a dealer for repairs.
- 6) Do not permit any liquids or objects to get inside the deck. The deck could be damaged if water or flammable or metallic objects get inside.



Pull the plug when disconnecting the cord.

Fig. 1



Take care not to damage the power cord.

Fig. 2

2. Installation

- 1) Avoid placing the unit on or adjacent to an amplifier, to prevent hum which is produced by some types of amplifiers. Move the unit to a place where it will not be affected by the amplifier. Keep the unit as far as possible from a TV set.
- 2) Avoid installing the unit in a location subject to excessively high temperatures (e.g. direct sunlight, near a heater, etc.), excessive humidity, dust, vibrations or magnetic fields.

3. Cleaning the heads

If this unit is used for a long period of time, its heads will become dirty. When they become excessively dirty, recording and playback will not be satisfactory. Because of this, clean the heads every 30 hours of playing time with a cleaning cassette available from your audio store.

Press the $\frac{1}{2}$ REC and $\frac{1}{2}$ PLAY buttons then, after another 10 seconds, press the \blacksquare STOP button.

4. Volume setting

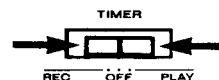
In DAT, digital signals are recorded and played back; because of this, it is difficult to set the appropriate volume using the level of noise as a reference. Do not raise the volume excessively even if the beginning of a tune seems quiet. Otherwise, when the level of the sound rises, it could damage the speakers or other equipment.

5. Condensation

- 1) If condensation forms on the head drum, the heart of a DAT unit, the tape may stick to the head drum and may be damaged.
 - 2) Condensation may occur in the following cases:
 - When the unit is moved from a cold place to a warm place.
 - In a room immediately after its heating has been switched ON, or in a place where the deck is exposed to cold air from a cooler.
 - In a place which is excessively humid.
 - 3) When condensation could have occurred in the DAT deck such as when it is moved from a cold place to a warm place, turn the POWER switch ON and leave it for about one hour before using it.
- When condensation is likely to occur, do not leave a cassette in the deck. It is recommended that you always remove cassette tapes from the deck when it is not in use.
- Use the deck where the ambient temperature is from 5°C(41°F) to 35°C(95°F).
- When the deck is used in a cold place, condensation may occur more frequently.

6. Timer switch setting

Set the TIMER switch to "REC" or "PLAY" when performing timer recording or playback. At other times, be sure to set the TIMER switch to OFF.



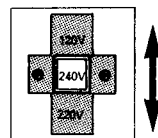
7. Heat radiation

Be careful not to block the ventilation holes so that the temperature inside the deck does not rise excessively. Do not install the unit in a badly ventilated place.

SELECTING THE AC SUPPLY VOLTAGE

When this deck is used in an area where the supply voltage is different from the preset voltage, reset the voltage selector to the correct position.

Slide the voltage selector with a screwdriver so that the desired voltage marking is in the window.



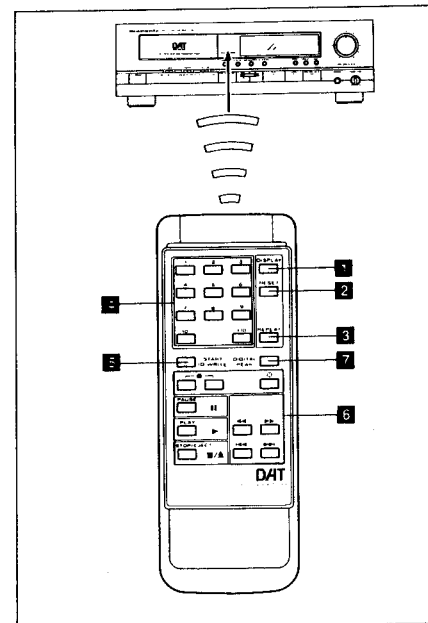
Caution:

Disconnect supply cord before changing the voltage.

REMOTE CONTROL OPERATIONS

Correct use of the remote control

- Press the button(s) while pointing the top of the remote control unit at the remote sensor on the front panel of the main unit.
- The operable range is about 7 meters away from the main unit. If operated at an angle, the range will be shorter.
- Do not allow direct sunlight or strong light from a fluorescent light, etc. to strike the remote sensor, as far as possible.



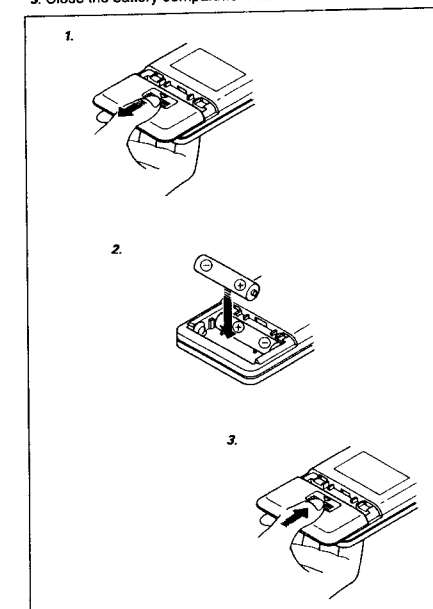
Name of parts and their functions

- 1 DISPLAY button
- 2 RESET button
- 3 REPEAT button
- 4 Numeric keys ("1" — "10", "+10")
Used to designate the desired tune directly.
- 5 START ID-WRITE button
Used to write a start ID.
- 6 Tape operations buttons
- 7 DIGITAL PEAK button
Used to recall or reset the maximum value stored in the digital peak memory.

* Other control buttons have the same functions as those on the front panel of the main unit.

Battery replacement

1. Open the battery compartment cover.
2. Insert two "R03" batteries.
3. Close the battery compartment cover.



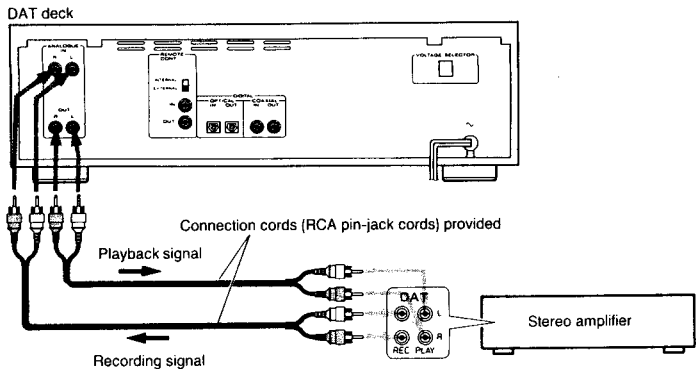
Notes:

1. When the distance from which the remote control unit is effective becomes shorter, the batteries are almost exhausted. Replace the batteries with new ones.
2. Be sure to use two "R03" batteries in the remote control. Incorrect use of batteries may cause corrosion or an explosion.
 - Insert the batteries into the battery compartment with correct positive \oplus and negative \ominus polarities.
 - Do not use old and new batteries together.
 - When the unit is not to be used for an extended period of time, remove the batteries to prevent damage due to corrosion.

CONNECTIONS

- Do not switch the power on until all connections are completed.
- Insert the plugs firmly; poor contact can cause noise.
- When RCA pin-plug cords are employed, always connect the white plug to the left channel terminal. This helps avoid reversed connections.

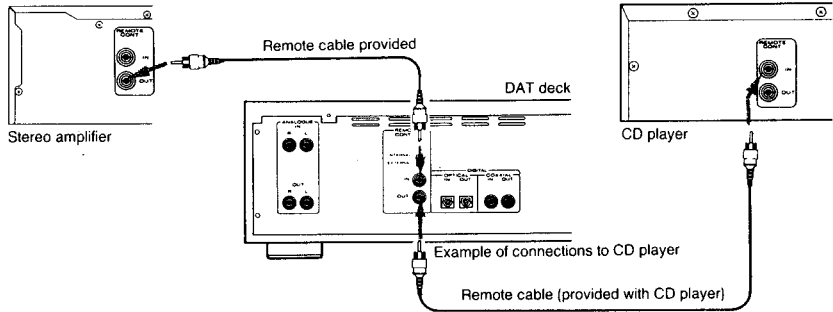
1. Connection to stereo components
(Analog signal lines)



- When the stereo amplifier is not provided with DAT terminals, refer to its instruction manual.

2. Remote cable connection for REMOTE CONT.

- By connecting a remote cable, REMOTE CONT functions (auto source select and synchro recording) can be performed.
- When making synchro recordings with a CD player, connect the remote cable to the REMOTE CONT. jacks.



- Connect the REMOTE CONT. jack of the deck to the REMOTE CONT. jack of the amplifier using the remote cable provided to perform auto source selection.

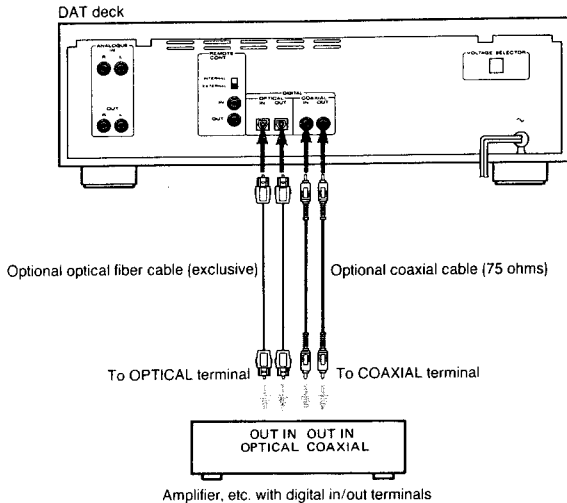
Note:
When installing this unit, leave an appropriate distance between it and your stereo amplifier, tuner and television set. If they are too close, noise (induced hum) may occur. We recommend that you use outdoor FM and TV antennas.

3. Connections to stereo components
(Digital signal lines)

- To transmit digital signals between the DAT deck and an amplifier with digital in/out terminals exclusively for DAT, use the DIGITAL IN/OUT terminals on the rear panel of the deck. For the transmission of digital signals, two types of cables can be used; COAXIAL (for electrical signals) and OPTICAL

(for optical signals). Either of these can be used for digital signal transmission.

- With digital signals, only one cable is used for the transmission of both the left and right channel signals.



- OPTICAL connection**
Remove the caps from the OPTICAL terminals and connect the DIGITAL OPTICAL IN/OUT terminals to the amplifier, etc. using exclusive optical fiber cables.

Note:
Clean the tip of the plug of the optical cable before connecting it.

• Synchro recording with CD player

When making a synchro recording with a CD player, as well as connecting the optical fiber or coaxial cable, perform the following connections.

- Connect the REMOTE CONT. terminals with the remote cable. (See page 8.)
- Connect the OUTPUT terminal (analog) of the CD player and the ANALOG IN terminal with a RCA pin cord.

- Red light in the OPTICAL OUT terminal:**
When the power is turned on, a red light appears inside the terminal. This is used to transmit the digital signal. Although it is not dangerous even when it strikes the eyes directly, do not remove the cap covering the terminal when not in use.

- Notes:**
- When a digital program is encoded with a "copy prohibit" code (except in case of SCMS), it cannot be copied digitally. To copy such a program, perform analog connection. (Refer to page 13.)
 - Never connect the digital coaxial cable to the analog input terminals of an amplifier, etc. as this could seriously damage the amplifier.
 - When the OPTICAL terminals are used for digital connection, check that the optional exclusive optical fiber cables can be inserted into the terminals of the amplifier.
 - Do not bend optical fiber cable sharply. For details, refer to its instructions.
 - When both the ANALOG and COAXIAL terminals of the DAT deck are used for the connection of certain components (amplifiers, tuners, cassette decks, etc.), noise (induced hum) may occur. In this case, disconnect any unused IN/OUT terminals.

DAT CASSETTES

Concerning DAT cassettes

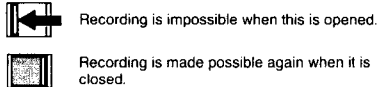
- Use cassette tapes with the DAT logotype shown here.



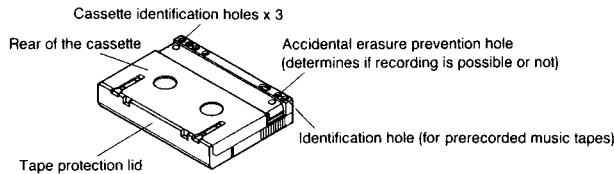
- When a tape on which a recording has previously been made is used for recording, the previously recorded signals will be erased automatically, and the tape will contain only the new recording.



- DAT cassettes have sliding safety tabs to prevent accidental erasure. Be sure to open the tabs of cassettes containing important recordings which you want to protect against accidental erasure.



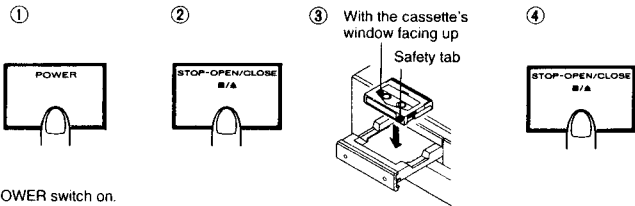
- DAT cassettes cannot be used upside down.
- DAT cassettes have a lid (cover) to prevent the accumulation of dust or dirt on the surface of the tape. Do not open this forcibly.



Cautions on storage of DAT cassettes

- Do not leave cassettes in a place exposed to direct sunlight or near a heater, etc.
- Do not leave cassettes in a place subject to excessive humidity.
- Do not drop cassettes or expose them to excessive vibrations or shocks.
- Do not leave cassettes in a place subject to excessive dust.
- Do not store cassettes where there is a strong magnetic field, such as near a motor, transformer or permanent magnet, etc.
- When not using them, always replace cassettes in their plastic cases.

Loading DAT cassettes



- ① Set the POWER switch on.
- ② Press the / STOP-OPEN-CLOSE button to open the cassette tray.
- ③ Insert the cassette with its window facing up.
- ④ Press the / STOP-OPEN-CLOSE button to close the cassette tray.

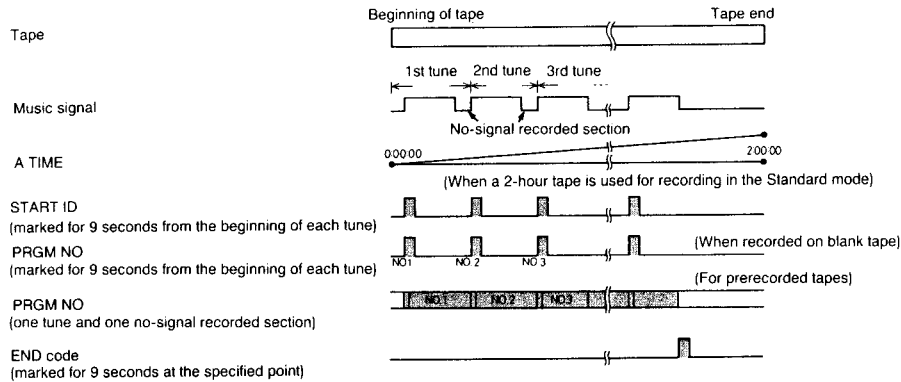
SUB CODES

"Sub codes" are codes recorded on the tape separately from the music signals. They are mainly used to provided various functions which make the DAT system more convenient. These codes are necessary for search operations (direct access playback), etc.

Types of sub codes and details

Name		Details	Functions
Information data	A TIME	Shows the elapsed recording time from the beginning of the tape. (Absolute Time)	The absolute time is marked together with the music signal and allows the elapsed time from the start of tape to be displayed.
	PRGM NO	Shows the tune number, counting from the beginning of the tape. (Program Number)	With this code, direct access playback using the remote control unit is possible.
ID (Identification) Data	START ID	Indicates the beginning of a tune	Using the AUTO SEARCH buttons, the beginning of any tune can be found easily.
	END code	Indicates the point at which the previous recording ended.	When a tape is played back or fast forwarded, the deck stops automatically at the beginning of the End code.

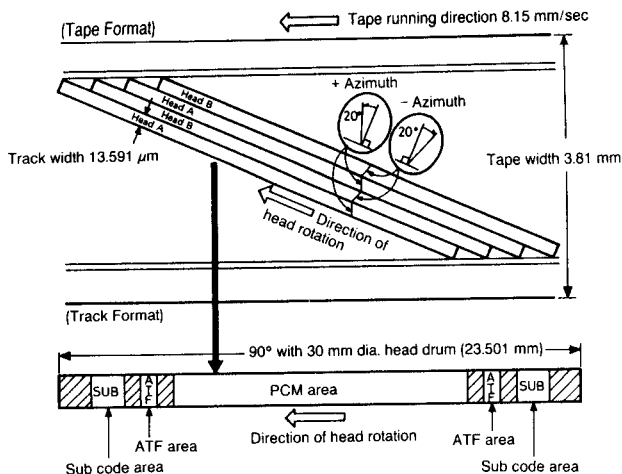
Relationship between the music signal and sub codes



- The sub code recording time shows the time when the tape is recorded in the 48k, 44k or 32k mode. When recorded in the 32k-LP mode, the recording time will be doubled.

Note:
 When the deck is set to the 32k-LP mode, the A TIME is marked at half the speed compared with other modes. This is to match the A TIME and the position of the tape with a one-to-one relationship.

TECHNICAL INFORMATION ABOUT
 DAT

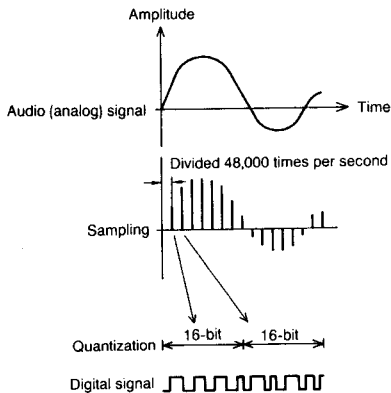


DAT recording system

- In a DAT deck, heads mounted in the head drum rotate at high speed to record digitally-encoded signals on the tape at an angle to the tape. This system is called "helical scanning".
- **PCM (music signal) area:** Digitally-encoded music signals are recorded in this area.
- **ATF (Automatic Track Finding) area:** This area is used for recording ATF signals which control the heads so that they trace the recorded signal for accurate and stable tracking and the correct signals are picked up by the rotating heads.
- **Sub code area:** This area is for recording the signals which enable various functions such as high-speed search and editing. With the DT-80, A TIME (absolute time), Program No., Start ID and End codes can be recorded.

Digital signal processing

- **Digital recording in the 48 kHz standard mode**
Signals are converted from analog to digital before being recorded. This is called A/D conversion.



1. The amplitude of the analog audio signal to be recorded is detected 48,000 times per second by "slicing" the signal. This is called "sampling at a frequency of 48 kHz".
 2. The length of each slice is rearranged as 16 data bits. This is called "16-bit quantization".
 3. Each quantized signal is encoded as a binary number (0s and 1s) for digital recording.
- **Digital playback**
The quantized digital signals recorded on the DAT tape are reconverted to analog signals through a D/A converter which performs the reverse operations to those performed in A/D conversion.

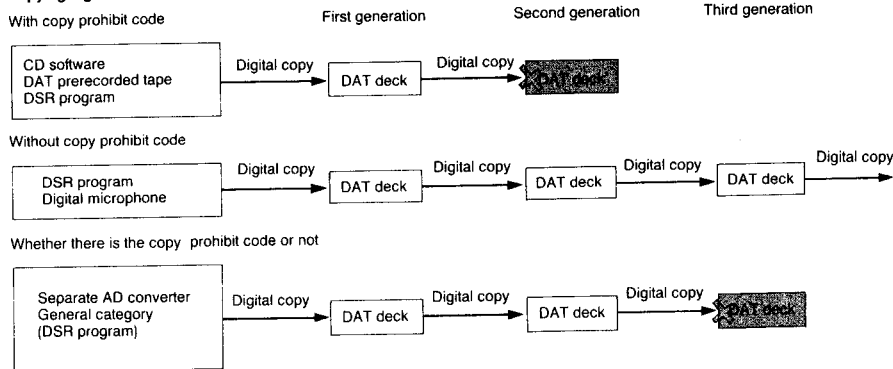
SCMS (Serial Copy Management System)

- SCMS controls the DAT's serial copy with the digital signal.

It is possible for a SCMS-compatible DAT deck to record digital sources including CDs, DAT prerecorded tapes, DSR (Digital Satellite Radio) programs onto DAT tape with a direct digital input. For sources such as CDs, DAT tapes and DSR programs covered by SCMS regulations, copy-permitted programs can be recorded on DAT tape whether or not they contain a copy-prohibit code. When the copied (recorded) tape is played back

by a DAT deck and the digital output is input to the another DAT deck, digital recording can be performed if there is no copy prohibit code, however, digital recording cannot be performed if there is a copy prohibit code. Namely, one — and only one — copy can be made of a digital source with a copy prohibit code, and second-generation, third-generation and serial copying is not possible. SCMS applies in any DAT mode, regardless the sampling frequency. The following illustrations show the principles of the SCMS system.

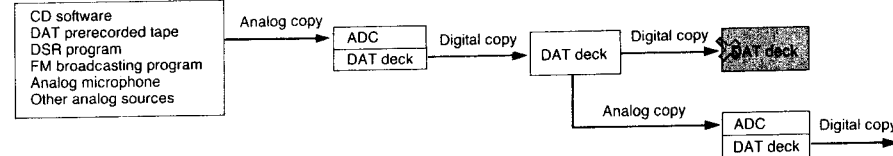
• Copying digital sources



• Copying analog sources

When an analog signal is input, this signal can be recorded by a DAT deck because this signal does not contain a copy prohibit code. However, since the signal recorded on the tape

has passed through the A/D converter (ADC), the tape is treated as a DAT prerecorded tape which contains the copy prohibit code.



Note:

An A/D converter performs sampling and quantization to convert an analog signal into a digital signal. This signal processing is called "A/D conversion" and the circuit which performs it is called an A/D converter.

RECORDING

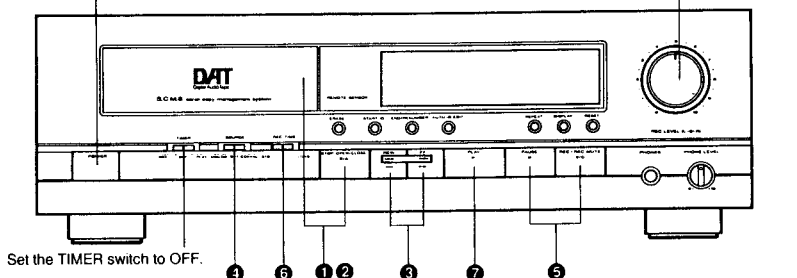
Before performing recording:

- Make sure the safety tab of the cassette is closed.
- Set the TIMER switch to OFF before switching the POWER ON.

It may be unlawful to record or playback copyrighted material without the consent of the copyright owner.

— Operate in numerical order. —

Set the POWER switch to ON.



Set the TIMER switch to OFF.

- 1 Press the **STOP/OPEN-CLOSE** button to open the cassette tray.
- 2 Insert a cassette with its window facing up.
- 3 Locate the position from which recording should start with the **SEARCH** buttons.
 - ◀: When recording is to start from the beginning of the tape.
 - ▶: When recording is to start from the middle of the tape. (The End code is detected.)
- 4 Select the source to be recorded.
 - ANALOG: When recording analog input signals
 - OPTICAL or COAXIAL: When recording digital input signals
- 5 Set the deck to the rec-pause mode.
 - "SAMPLING MONITOR" lights.
- 6 Select the recording mode. When recording analog signals, adjust the recording level.

Recording mode

REC TIME switch	Analog recording	Digital recording	
STD	48k mode	32k mode	48/44k mode
LONG	32k-LP mode	32k-LP mode	

- 7 Press the **PLAY** button to start recording.

When recording a digital signal

The recording level, sampling frequency and emphasis status are recorded as they are. It is not necessary to adjust the recording level.

For details about digital recording, see page 17.

When the end of a tape is reached

With the auto rewind function, the tape is rewound to its beginning and stops automatically.

Tape protection

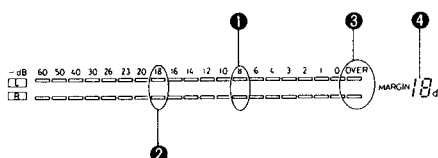
When the cassette tray is closed, sometimes it will pop out again; this is to protect the tape. If this happens, adjust the position of the cassette and close the tray again.

Notes:

1. When starting recording at the beginning of the tape, leave a no-signal recorded section of about 10 seconds.
2. "TOP" is displayed when the deck enters the rec-pause or rec. mode after the tape has been rewound.

Recording level adjustment

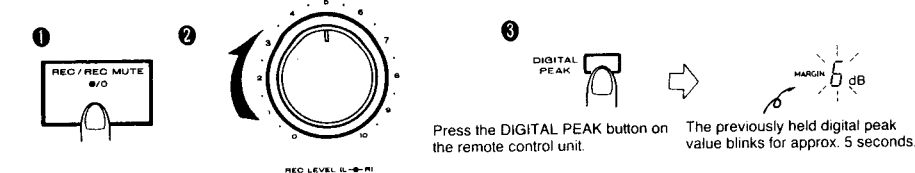
(only when an analog signal is to be recorded)



Peak level meter and digital peak display:

- 1 **Peak level meter**
Values higher than -40 dB will be displayed for the left and right channels independently, while peak values are held for approx. 2 seconds.
- 2 **Reference level indicator**
Shows the reference input level of the DAT deck at a position -18 dB from the full-scale level.
- 3 **OVER level indicator**
Lights when the recording level is too high.
- 4 **Digital peak display**
Shows the margin between the maximum input level and the input level of the signal being recorded in 1-dB steps, within a range of -19 dB to 0 dB.

Adjusting the recording level



- 1 Press the **REC/REC MUTE** button. The deck enters the sampling monitor mode.
- 2 Adjust the recording level.
Set the recording level by referring to the digital peak display. Adjust the maximum value of the recording level so that the OVER indicator does not light.
- 3 Check the digital peak level.

- While the previously held digital peak value is blinking, press the DIGITAL PEAK button again so that the new peak value is held in memory.

Sub code marking during recording

In the following case, the A TIME (absolute time), Start ID and Program No. codes will be marked automatically.

Sub code	Condition for automatic marking
A TIME	<ul style="list-style-type: none"> • When recording starts from the beginning of the tape • When the previously marked A TIME is read and displayed
Start ID	<ul style="list-style-type: none"> • When the signal is input after the level of the input signal drops to a specified level (no-signal) for more than 3 seconds during recording. • When the first signal is input immediately after recording starts
Program No. (tune No.)	<ul style="list-style-type: none"> • When recording starts from the beginning of the tape • When the previously marked program No. is read out and displayed

To stop recording

Press the END button so that the End code is marked.

This makes it easy to locate the position where next recording should be started; the A TIME codes marked in the new recording are continuous from those marked in the previous recording.

END/RENUMBER



Sampling monitor

This is used to check the quality of the source sound before you start recording, or to check the recording level.

- In the stop mode, press the **REC/REC MUTE** button ...
- Set the deck to the recording or rec-pause mode ...

The SAMPLING MONITOR indicator lights and the source sound can be monitored.

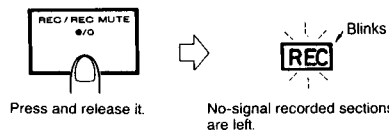
Notes:

1. If the recording level is set to a value where the OVER level indicator lights continuously, the recording signal will saturate the tape and the sound will be distorted. Decrease the recording level to a level at which the OVER level indicator does not light.
2. **Emphasis**
With emphasis, high-frequency signals are recorded after increasing their level (preemphasis); during playback this process is reversed (deemphasis). This improves the S/N ratio at higher frequencies.
This deck incorporates only a deemphasis circuit, so it is possible to play back signals which were recorded with emphasis; however, it is impossible to record signals applying emphasis.

Record muting

This is used to leave an appropriate no-signal recorded section between tunes.

- When a section of the source you do not want to record is reached during recording, press the **REC/REC MUTE** button then release it. The REC indicator blinks and a no-signal recorded section is left during record muting operation.



- About 4 seconds later, the REC and PAUSE indicators light and the deck enters the rec-pause mode.

- Press the **PLAY** button to start recording again.

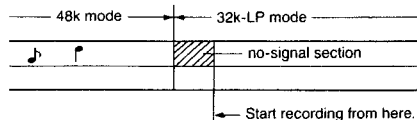
To leave a no-signal recorded section of more than 4 seconds
Keep the **REC/REC MUTE** button pressed continuously as long as you want to leave a no-signal recorded section. When the button is released after the above operations, the deck enters the rec-pause mode.

- A TIME codes will be written continuously even when the rec-mute mode is engaged.

To make recordings in different recording modes on one tape

Be sure to leave a no-signal section before starting recording in the new mode.

Example: To change the recording mode from 48k to 32k-LP



- Set the deck to the rec-pause mode.
- Change the recording mode.
- Press the **REC/REC MUTE** button.
 - After 4 seconds, the deck enters the rec-pause mode. Press the **PLAY** button to start recording.

Note:

When making a recording, if you change the recording mode (48k, 44k, 32k or 32k-LP) in the middle of a tape, be sure to leave a no-signal section using the Record Mute function, etc. before starting recording in the new mode.

Synchronized recording with the CD player

Preparation: Connect the connecting cord to the REMOTE CONT. jack on the CD player beforehand.

- Insert the cassette tape. Set the desired starting point of the tape for recording.
- Press the **REC/REC MUTE** and the **PAUSE** buttons simultaneously to enter "REC/PAUSE" mode.
 - The DAT deck should be operated from the stop mode.
- Set the **TIMER** switch to **PLAY**.
- Press the **PLAY** button of the CD player.
 - Recording in the programmed order is possible if the desired tracks have been programmed beforehand.

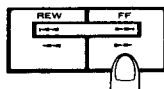
On completion of the above procedures, the recording to the DAT deck starts automatically and the recording is carried out.

The DAT deck enters stop mode automatically when the play of the CD player is over.

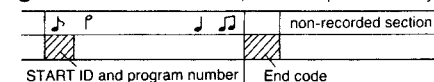
Blank search

- This is used to locate the point in the middle of a tape where the previous recording ended, so a new recording can be made from that position.

- Load a cassette and press the **FF** (fast-forward) button.



- When the End code is detected, the deck stops automatically.



The tape is automatically rewound to the beginning of the End code and stops there.

FF

- When an End code is not marked, the deck automatically stops just before the non-recorded section of the tape.
- If new tape is loaded, the tape is first fast-forwarded and after 5 seconds, the tape is rewound.

Non-recorded sections (blank) and no-signal recorded sections

In DAT decks, a non-recorded section (blank section) refers to that part of the tape which has not yet been used for recording; this distinguishes it from a no-signal recorded section, which has been used for recording but without a music signal.

In conventional compact cassette tapes, no-signal sections are left between tunes, however, in DAT cassettes, the track pattern is encoded and A TIME codes and other signals are encoded continuously in the sub code area.

Note:

To make a non-recorded tape, adjust the INPUT LEVEL controls to "MIN", then start recording. The previously recorded signal will be erased. New A TIME codes will be written to the tape.

Digital recording

- Check whether digital recording is possible or not referring to the DIGITAL INPUT indicator and the COPY PHBT indicator.

- Set the **SOURCE** switch to **COAXIAL** or **OPTICAL** and check the DIGITAL INPUT indicator.

- When the source sound is input.

DIGITAL INPUT indicator	Digital signal is input or not
blinks slowly	not input
lights	input
blinks rapidly	input (recording is impossible)

- When the DIGITAL INPUT indicator blinks rapidly, digital recording cannot be performed. Set the **SOURCE** switch to **ANALOG** to perform analog recording. (The DIGITAL INPUT indicator goes off.)

- Check the COPY PHBT indicator in the sampling monitor mode.

	DAT deck mode		Status of recorded tape
	during sampling monitoring	during recording	
COPY PHBT Condition of the indicator	not lit	not lit	Further digital copying is possible
	blinks	lights	Further digital copying is not possible
	not lit	blinks	Only one copy is possible

- If a source cannot be recorded, check the condition of the COPY PHBT indicator in the sampling monitor mode.

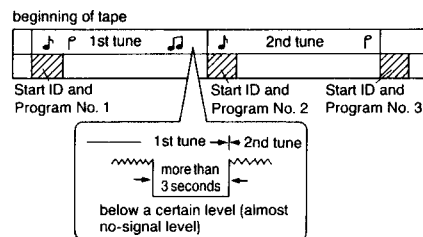
Notes:

- When you attempt to record a source the digital recording of which is impossible, the deck enters the rec-pause mode automatically, and the DIGITAL INPUT indicator blinks rapidly.
- When digitally recording some CDs, depending on the CD player used, sometimes the beginning of certain tunes will be cut or noise recorded. This is because the digital input signal is unstable and the DAT deck enters the rec-pause mode automatically when the mode of the CD player is changed. In this case, perform digital recording as follows:
 - Set the DAT deck to the rec-pause mode.
 - Locate the position slightly before that from which recording should start. Now start the CD player.
 - Press the **PLAY** button of the DAT deck just before the required tune.

SUB CODE MARKING

Automatic Start ID and Program No. code marking

When recording is started from the beginning of a tape, the Start ID and Program No. codes will be marked automatically.



- When the signal drops below a certain level for more than 3 seconds between tunes, the next Start ID and Program No. codes are marked automatically.

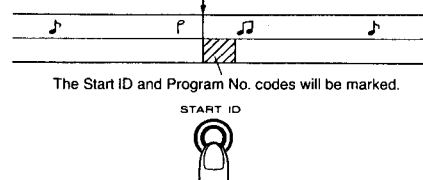
Notes:

- When a very quiet sound (such as a pianissimo passage) continues for a relatively long time, Start ID and Program No. codes might be marked erroneously.
- When the gap between tunes is less than 3 seconds, neither the Start ID nor Program No. codes will be marked.
- When operating using the remote control unit, the ST-WRITE button has same function as the START ID button of the main unit.

Manually marking Start ID and Program No. codes

The Start ID and Program No. codes are marked by pressing the START ID button during recording when the gap between tunes or no-signal portions is less than 3 seconds.

Press the START ID button at the beginning of a tune.



- With this operation, manual marking is possible anywhere you want Start ID and Program No. codes.
- When recording is to start from the middle of the tape, first rewind the tape to read the Program No. codes which have already been marked.

Note:

Another Start ID code cannot be marked for 9 seconds after automatic or manual marking has been started. (When recording in the 32k-LP mode, this period becomes 18 seconds.)

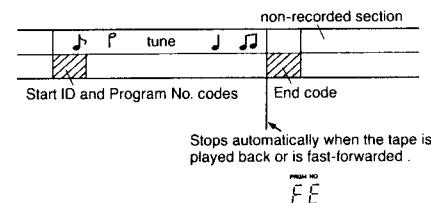
Marking the End code (Manual)

Be sure to mark the End code when you stop recording in the middle of a tape.

- Press the END button at the end of recording.



- When the End code has been marked, the tape is rewound to the beginning of the End code and the deck stops automatically.



Note:

The End code cannot be marked in the stop mode.

Marking sub codes after recording

- Outline of operation for marking sub codes after recording**
We recommend that sub codes are marked after recording.

Operate as follows:

- First play back the recorded tape and check that Start ID codes have been marked correctly at the beginning of each tune.
- Delete unnecessary sub codes (Start ID codes).
- Insert additional Start ID codes at the beginnings of any required tunes.
- Mark the Start ID code using the AUTO ID EDIT function. (See page 20.)
- Renumber the Program No. codes with the RENUMBER function. (See page 19.)

- When a Start ID is detected during playback, an indicator is displayed in the display window. Each time a Program No. or End code is detected, the PRGM NO changes.

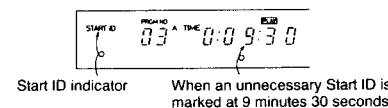
Note:

Marking the sub codes is impossible when the safety tab (accidental erasure prevention tab) is open. Check that the safety tab is closed if you want to mark sub codes after recording.

Deleting sub codes

- To delete Start ID (Program No.) codes

- Play the tape and locate unnecessary Start ID codes.



- Press the Start ID erase button while START ID is displayed.



- The tape is rewound and stops at the beginning of the unnecessary Start ID code.
- When an unnecessary Start ID code has been erased, the START ID indicator disappears and the tape stops automatically.
- The Program No. is also erased at the same time if it has been marked with the Start ID code.

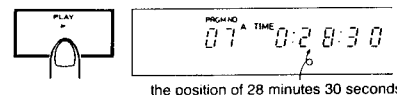
Deleting the End code

When recording starts after detecting the End code, the End code will be erased automatically.

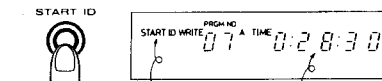
Marking Start ID codes

- This is used to mark Start ID codes at the required points.

- Start playing the tape and find the point a Start ID code should be marked.
Example:
When marking a Start ID code at 28 minutes 30 seconds.



- Press the START ID button.



Indication while marking the Start ID code (when the Start ID code has been encoded)

- When marking is finished, the "START ID WRITE" indicator goes out.

Repeat the above procedures ① through ② to mark all required Start ID codes.

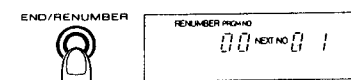
Notes:

- Be sure to mark Start ID codes leaving a gap of at least 18 seconds (36 seconds in the 32k-LP mode).
- While a Start ID code is being marked, sound may be skipped at the beginning and the end of the Start ID code; this is not abnormal.

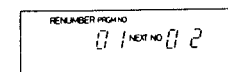
Marking Program No. codes (Renumbering)

- After marking Start ID codes is completed, insert Program No. codes at the same points.

- Press the RENUMBER button in the stop mode.



- The tape is rewound to its beginning and then Program No. codes are marked at the points where Start ID codes are detected, in sequence starting from 1.



When Program No. code 1 is renumbered.

- The numbers shown by the PRGM NO and NEXT NO indicators are counted up.

- When the tape reaches its end, this operation is completed and the tape is rewound to the start automatically.
- When the End code is detected, the deck stops at the beginning of the End code.

Note:

Renumbering cannot be done during recording. Perform renumbering in the stop mode.

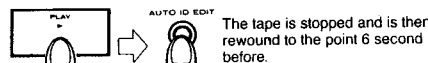
AUTO ID EDIT operations

This function is to re-locate Start ID codes which are being marked slightly after the beginning of a tune by the Start ID marking function.

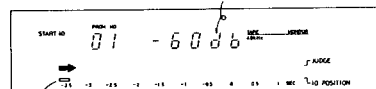
Start ID codes are re-marked from 0.5 second before the beginning of the tune.

With this function, the beginning of any tune can be located more accurately.

- 1 Play back the tape and press the AUTO ID EDIT button at the point from which the Start ID code is to be remarked.



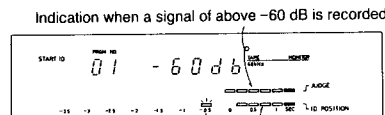
The presence of a music signal is judged at the -60 dB level. If a blank space is not detected, the level at which judgement is performed becomes -50 dB or -40 dB.



The point at which Start ID codes are marked is adjusted in steps of 0.25 seconds

- 2 When the appropriate point is detected, the ID POSITION indicator blinks.

Example:



Indication of the most appropriate marking point Indication of the recorded Start ID code

- 3 Press the START ID button.

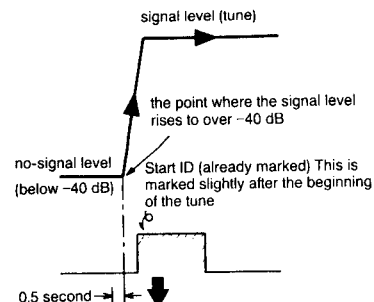


- The START ID WRITE indicator lights and the Start ID and Program No. codes are re-marked.
- When remarking is complete, the deck stops automatically.

- The appropriate marking point is also detected if the AUTO ID EDIT button is pressed in the stop mode.

- The JUDGE indicator lights when the tune is found.

- The appropriate Start ID code marking point is.

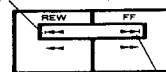


With the AUTO ID EDIT function, the Start ID code is marked 0.5 second before the beginning of the tune. This is a more appropriate point.

- To move the Start ID code marking point.

Press the ◀◀ or ▶▶ button while the ID POSITION indicator is blinking.

Every time this is pressed, the Start ID code is moved backward in steps of 0.25 seconds. (up to 3.5 seconds)



Every time this is pressed, the Start ID code is moved forward in steps of 0.25 seconds. (up to 1 second)

- When all of the JUDGE indicators light and "0" blinks in the ID POSITION indicator.

This indicates that an appropriate marking point below -40 dB cannot be found. Repeat operation 1 again.

Notes:

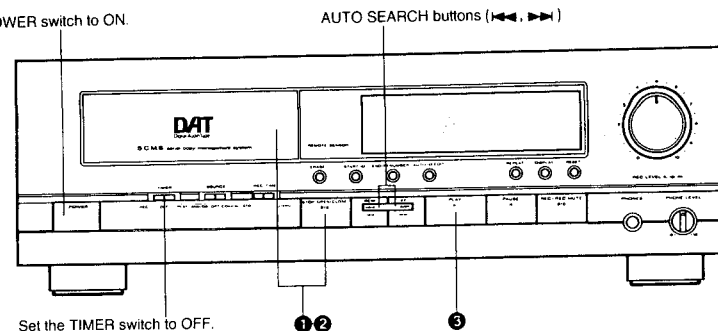
1. To cancel the AUTO ID EDIT function while it is operating, press the ■ STOP or ► PLAY button.
2. When no tune is detected, the JUDGE indicator will not light.
3. When a tape on which A TIME codes have not been marked is loaded, this function will not work.
4. When a section with a no-signal level (below -40 dB) cannot be detected, mark the Start ID code referring to "marking Start ID codes" on page 18.
5. Start ID codes are marked and shown by the ID POSITION indicator in steps of 0.25 seconds. They could sometimes be delayed if the AUTO ID EDIT button has been pressed.

PLAYBACK

— Operate in numerical order. —

Before starting operation, set the TIMER switch to OFF.

Set the POWER switch to ON.



Set the TIMER switch to OFF.

- 1 Press the ■ STOP/OPEN-CLOSE button to open the cassette tray. (See page 10.)
- 2 Load a cassette with the window of the cassette facing up and close the tray.
- 3 Press the ► PLAY button. Playback will start.
 - The sampling frequency is displayed in the display window.

- When a tape is played back to its end...

The auto rewind function rewinds the tape to its start at which point it stops automatically.

- To stop playback in the middle of a tape..

Press the ■ STOP button. Press it again to open the cassette tray.

- If the EMPHASIS indicator lights..

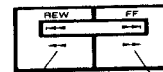
When the tape is reached a position where emphasis is applied, high-frequency signals are deemphasized automatically by the deemphasis circuit.

- If a tape recorded in 32k-LP mode is played back..

The 32 kHz and "LONG PLAY" indicators light in the display window.

- To fast-forward or rewind the tape so you can hear the speeded-up sound at a lower volume..

Press the ◀◀ or ▶▶ button during playback. The tape advances at 3 times normal speed.



To cue to a tune in the reverse direction (review function) To cue to a tune in the forward direction (cue function)

- When the button is released, normal playback will resume.

Notes:

1. If the End code is detected while the tape is being played back or fast-forwarded, the tape stops automatically. Press the ◀◀ button and rewind the tape.
2. If a new tape is played back, the tape is rewound to its start within 10 seconds.
3. If the non-recorded section of a recorded tape is played back, the tape is rewound to the end of the last tune within 10 seconds and stops automatically.
4. During high-speed playback, at the point where the mode was changed in recording, sound might not be heard. In this case, first perform normal playback and then set to the fast-forward or rewind mode.

- When playing back a tape you have recorded yourself (recorded on blank tape)

- When the cassette is loaded..

- If A TIME codes have been marked on the tape, they are detected and displayed in the display window.
- When a rewind tape is loaded, first (— 00:01) is displayed and then the A TIME code is displayed.
- Program Nos. will be displayed when they are detected.

- When no Program No. is displayed in the PRGM No. display:

Program No. codes are marked at the beginnings of tunes together with Start ID codes. If the cassette is loaded/unloaded in the middle of a tune and if a Program No. code has not been marked at that point, no Program No. will appear in the display. To display the Program No. in this case, continue playback or set the deck to the fast-forward/rewind mode so that the Program No. code is read out.

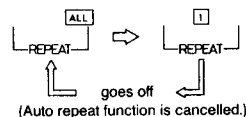
Auto repeat

This is used to play back tunes you want to listen again.



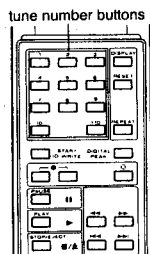
ALL: all tunes are repeated
1: the current tune is repeated

Every time the REPEAT button is pressed, the following indications are displayed.

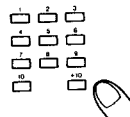


Direct access playback

Playback with program No. codes (can only be performed using the remote control unit)



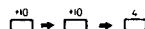
- When designating Program Nos. 1 to 10.



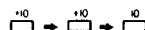
Press the Program No. button corresponding to the number of the tune.

- When designating tune No. 11 or higher.. Designate the required tune No. by pressing the +10 button and a Program No. button. (When the +10 button is pressed once, the "NEXT NO -1" is displayed.

example: when designating 24



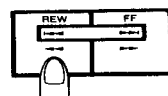
example: when designating 30



- When the program No. code of the required tune is detected, playback starts.

Playback using Start ID codes

To find the beginning of the previous tune..

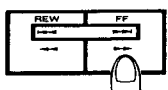


Indicator blinks
NEXT NO -1

When the REW button is pressed three times, the tape is rewound to the beginning of the tune 2 before the current tune.

- Every time this is pressed, the start of the previous tune is detected.

To find the beginning of the next tune..



Indicator blinks
NEXT NO +1

When the FF button is pressed twice, the tape is fast-forwarded to the beginning of tune after next.

- Every time this is pressed, the start of the next tune is detected.



- When the Start ID code of the required tune is detected, playback starts.

Notes:

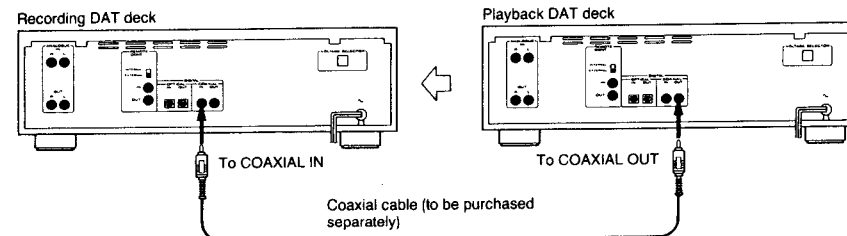
- Tapes on which Program No. codes have not been marked cannot be used for this operation if designating is performed using the tune number buttons. Tapes on which Start ID codes are not marked cannot be used for this operation using the REW/FF/AUTO SEARCH button.
- When the PAUSE button is pressed while searching, the deck enters the pause mode after locating the desired tune.

DIGITAL DUBBING

— Operate in numerical order. —

Connection (COAXIAL connection)

When two DT-80 DAT decks are used together, digital dubbing of tapes is possible.



Set the SOURCE switch to the COAXIAL position.

Operations

	Operation of recording deck	Operation of playback deck
1	Load a blank DAT cassette. • Check that the safety tab of the cassette is in place. • When dubbing from the middle of the tape, the deck should first read out the A TIME and the Program No. codes.	2 Load the DAT cassette from which dubbing is to be performed. • When dubbing the tunes in the order in which they were recorded, the program number should be displayed.
3	Set the SOURCE switch to "COAXIAL". • The DIGITAL INPUT indicator lights in the display window.	
4	Set the REC TIME switch to the recording mode. • 32k mode ... STD • 32k-LP mode ... LONG	
5	Set the deck to the record mode from the rec-pause mode. • When Start ID codes have been encoded on the tape from which dubbing is to be performed, they will be copied to the new tape. • The signal on the new tape will be at the same level as that on the tape from which dubbing is performed.	
6		Press the PLAY button to start the dubbing operation.

When an OPTICAL cable is used for connection:

When using an optical digital cable, connect the OPTICAL IN terminal of the recording deck to the OPTICAL OUT terminal of the playback deck, and set the SOURCE switch to the OPTICAL position.

- If the tape speed (recording mode) has been changed in the middle of the tape being dubbed, dubbing is interrupted, the deck is set to the rec-pause mode and then the dubbing operation resumes.

- In digital dubbing, the copy has the same sampling frequency as the source. The recording mode cannot be changed using the recording deck's controls.

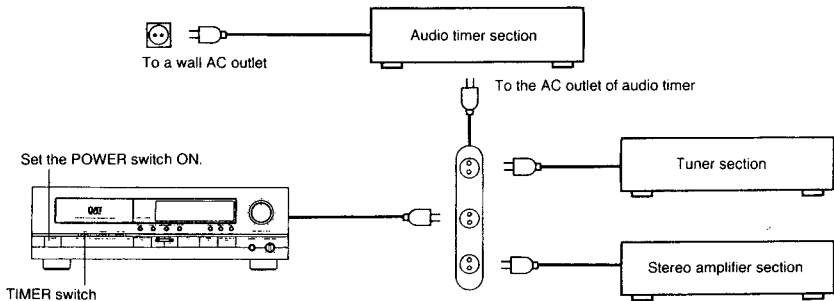
Sampling frequency of the playback tape	Sampling frequency of the recorded tape
48 kHz	48 kHz
44.1 kHz	44.1 kHz
32 kHz	32 kHz

Notes:

- Use either the COAXIAL connection (coaxial cable) or the OPTICAL connection (optical digital cable) for digital connection.
- When a tape with a digital copy prohibit code is loaded, the DIGITAL INPUT indicator blinks rapidly. In this case, the deck cannot be set to the record mode.
- If the COPY PHBT indicator blinks when a tape is being played back, digital dubbing of the tape is impossible.

TIMER RECORDING AND PLAYBACK

- When an optional audio timer is used together with the deck, recording and playback can be started at the desired time (when you are not at home, etc.)
- When an audio timer which can perform repeated ON/OFF switching is used, repeated recording and playback can be performed.
- **Connection to audio timer**
Set the POWER switches of all components to ON.
- Refer to the instruction manual of the audio timer used before starting timer recording/playback.
- A DAT cassette with its safety tab open cannot be used for recording.



Operation procedure	Timer recording	Timer playback
1. Timer operations	<ul style="list-style-type: none"> • Check that the POWER switches of all components connected to the timer are set to ON. • Operate the timer so that it turns on the power to each component. 	
2. Amplifier/tuner operations	<ul style="list-style-type: none"> • Tune to the required broadcast. FM broadcast: TUNER DSR broadcast: LINE 	<ul style="list-style-type: none"> • Set the TAPE MONITOR switch of the amplifier to ON. • Adjust the volume with the amplifier's volume control.
3. Deck operations	<ul style="list-style-type: none"> • Load the cassette on which the recording is to be made and operate for recording. (Refer to page 14.) 	<ul style="list-style-type: none"> • Load a prerecorded cassette and operate for playback. (Refer to page 21.)
4. Timer operations	<ul style="list-style-type: none"> • Program the timer's ON time for when recording/playback is to start and its OFF time for when it is to stop. • When programming the timer's ON time and OFF time, allow a margin of 1 minute for each. • Check that the power supplies of all components connected to the timer are turned OFF. 	
5. Deck operations	<ul style="list-style-type: none"> • Set the TIMER switch to the REC position. <div style="text-align: center;"> </div> <p>Recording will start when the preset time is reached.</p>	<ul style="list-style-type: none"> • Set the TIMER switch to the PLAY position. <div style="text-align: center;"> </div> <p>Playback will start when the preset time is reached.</p>

- Notes:**
1. After timer recording/playback has finished, be sure to set the TIMER ON/OFF switch of the DAT deck to its OFF position.
 2. After recording to the end of the tape in timer recording, rewind the tape with the ◀ button.

TROUBLESHOOTING

What appears to be a malfunction may not always be serious. Make sure first..

1. **Deck does not function when any buttons are pressed.**
 - * Is a cassette loaded?
 - * Had 5 seconds elapsed after the power was turned ON?
2. **Playback (recording) starts when the power is turned ON.**
 - * Is the TIMER switch set to PLAY(REC)?
3. **Recording is impossible.**
 - * Is the safety tab of the cassette open?
4. **Tape does not run.**
 - * Has the II PAUSE button been pressed?
5. **Playback sound is not output even although the tape runs.**
 - * Is the volume control set to its minimum position?
6. **Direct access playback cannot be done correctly.**
 - * Are Start ID codes marked on the tape?
 - * Have adjacent Start ID codes been marked within 18 seconds of each other (36 seconds in the 32k-LP mode)?
7. **Recording of digital input signal is impossible.**
 - * Has the SOURCE switch been set to ANALOG?
 - * Does the COPY PHBT indicator light in the sampling monitor mode?
8. **Cassette cannot be loaded. (Cassette is unloaded immediately after it is loaded.)**
 - * Is the tape damaged?
9. **Recording cannot be done correctly.**
 - * Are the heads dirty?
10. **Program No. does not change when the tune changes.**
 - * Did recording start from the middle of a tape which was previously used for recording?
11. **Tape does not run even though the ► PLAY button is pressed.**
 - * Has a non-recorded tape been loaded?
12. **Deck is not operated with the remote control unit.**
 - * Has the remote control switch on the rear panel been set the EXTERNAL?
 - * Set the remote control switch to INTERNAL.

- If the deck or tape malfunctions, the recording may not be performed correctly.
- We recommend that you make a test recording before making an important recording.

CARE AND MAINTENANCE

This section describes the care and maintenance tasks that must be performed to optimize the operation of your Marantz equipment.

CLEANING OF EQUIPMENT EXTERNAL SURFACES

The exterior finish of your DT-80 will last indefinitely with proper care and cleaning. Never use scouring pads, steel wool, scouring powders or harsh chemical agents (e.g., lye solution), alcohol, thinners, benzene, insecticide or other volatile substances as these will mar the finish of the equipment. Likewise, never use cloths containing chemical substances. If the equipment gets dirty, wipe the external surfaces with a soft, lint-free cloth.

If the equipment becomes heavily soiled:

- dilute some washing up liquid in water, in a ratio of one part detergent to six parts water
- dip a soft, lint free cloth in the solution and wring the cloth out until it is damp
- wipe the equipment with the damp cloth
- dry the equipment by wiping it with a dry cloth.

REPAIRS

Only the most competent and qualified service technicians should be allowed to service the equipment. The Marantz company and its factory-trained warranty station personnel have the knowledge and special facilities needed for repair and calibration of this precision equipment. After the warranty period has expired, repairs will be performed for a charge if the equipment can be returned to normal operation.

In the event of difficulty, refer to your dealer or write directly to the nearest location to you that is listed on the Marantz Authorised Service Station list. If writing, please include the model and serial number of the equipment together with a full description of what you think is abnormal about the equipment's behaviour.

■ Specifications

Basic format : Conforming to R-DAT format proposed by the DAT Conference, SCMS compatible DAT deck

Operation modes used :

	Recording/playback mode				Playback only mode
	48k	44k	32k	32k-LP	44k-WT
Tape speed (mm/sec)	8.15	8.15	8.15	4.075	12.225
Recording/playback time (R-120)*	120 min.	120 min.	120 min.	240 min.	80 min.
Sampling frequency	48 kHz	44.1 kHz	32 kHz	32 kHz	44.1 kHz
Number of bits quantization	16-bit linear	16-bit linear	16-bit linear	12-bit non-linear	16-bit linear

Number of channels : 2 Channels, stereo

Frequency response : 2 Hz — 22,000 Hz ± 0.5 dB (48k mode)
2 Hz — 20,000 Hz ± 0.5 dB (44k mode)
2 Hz — 14,500 Hz ± 0.5 dB (32k/32k-LP mode)

Signal-to-noise ratio : 92 dB (48k mode recording/playback)

Dynamic range : 94 dB (48k mode recording/playback)

Total harmonic distortion : 0.003% (1 kHz, 48k mode recording/playback)
0.08% (1 kHz, 32k-LP mode recording/playback)

Wow & flutter : Less than measurable limit ($\pm 0.001\%$ W.PEAK)

Access time : 5 minutes access time ; 8.0 seconds
60 minutes access time ; 31.3 seconds

Fast forward/rewind time : Approx. 52 seconds (R-120 cassette)

Error correction system : Doubly-encoded Read-Solomon Code

Input/output terminals (Analog) : LINE IN (RCA jack) x 2
Min input level; 63mV (500mV at full scale)
Input impedance ; 47 kohms
LINE OUT (RCA jack) x 2
Output level; 0.25V (2V at full scale)
Output impedance; 200 ohms
PHONES (6.3 mm dia. standard phone jack) x 1
Output level; 0 — 0.1mW/8 ohms (6.3mW/8 ohms at full scale)
Matching impedance; 8 ohms — 1 kohms

Input/output terminals (Digital) : COAXIAL IN (RCA jack) x 1
0.5Vp-p Input impedance; 75 ohms
OPTICAL IN x 1 ; -27 dBm — -14 dBm
COAXIAL OUT (RCA jack) x 1
0.5Vp-p Output impedance; 75 ohms
OPTICAL OUT x 1 ; -21 dBm — -15 dBm
Other terminals : REMOTE CONTROL (Pin jack) x 2
Power requirements : AC 240/220/120V, 50/60Hz
Power consumption : 24 watts
Dimensions (WxHxD) : 420 x 135 x 335 mm
Weight : Approx. 7.0 kg
Accessories : RCA-plug connection cord x 2
Remote cable x 1
Remote control unit (RC-80DT) x 1
Battery (size "R03" for remote control operation) x 2

● Only digital recording is possible in the 44k and 32k modes.

* R-120 is a DAT cassette with a recording time of 120 minutes in the Standard mode.

Specifications subject to change without prior notice.

1 Locations of Mechanism

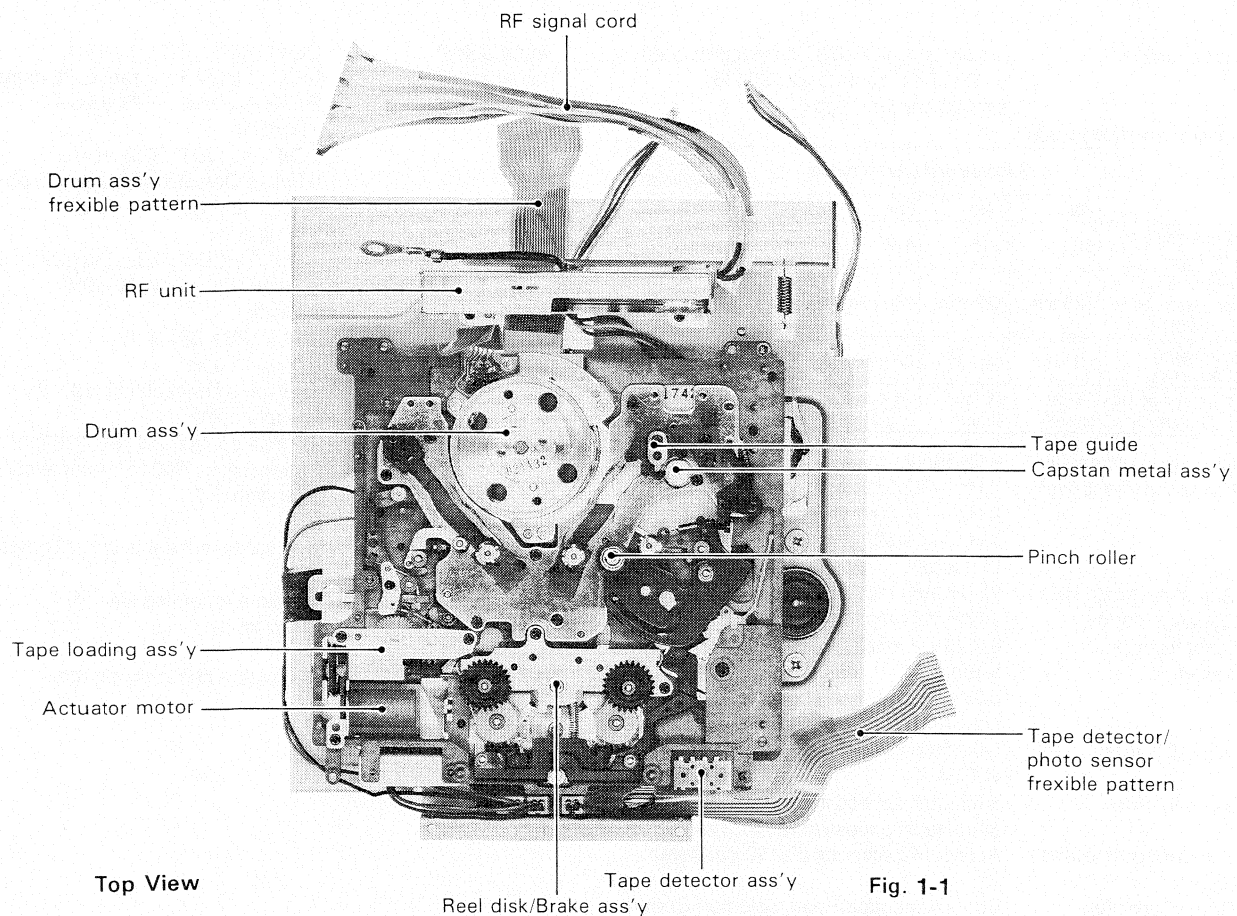


Fig. 1-1

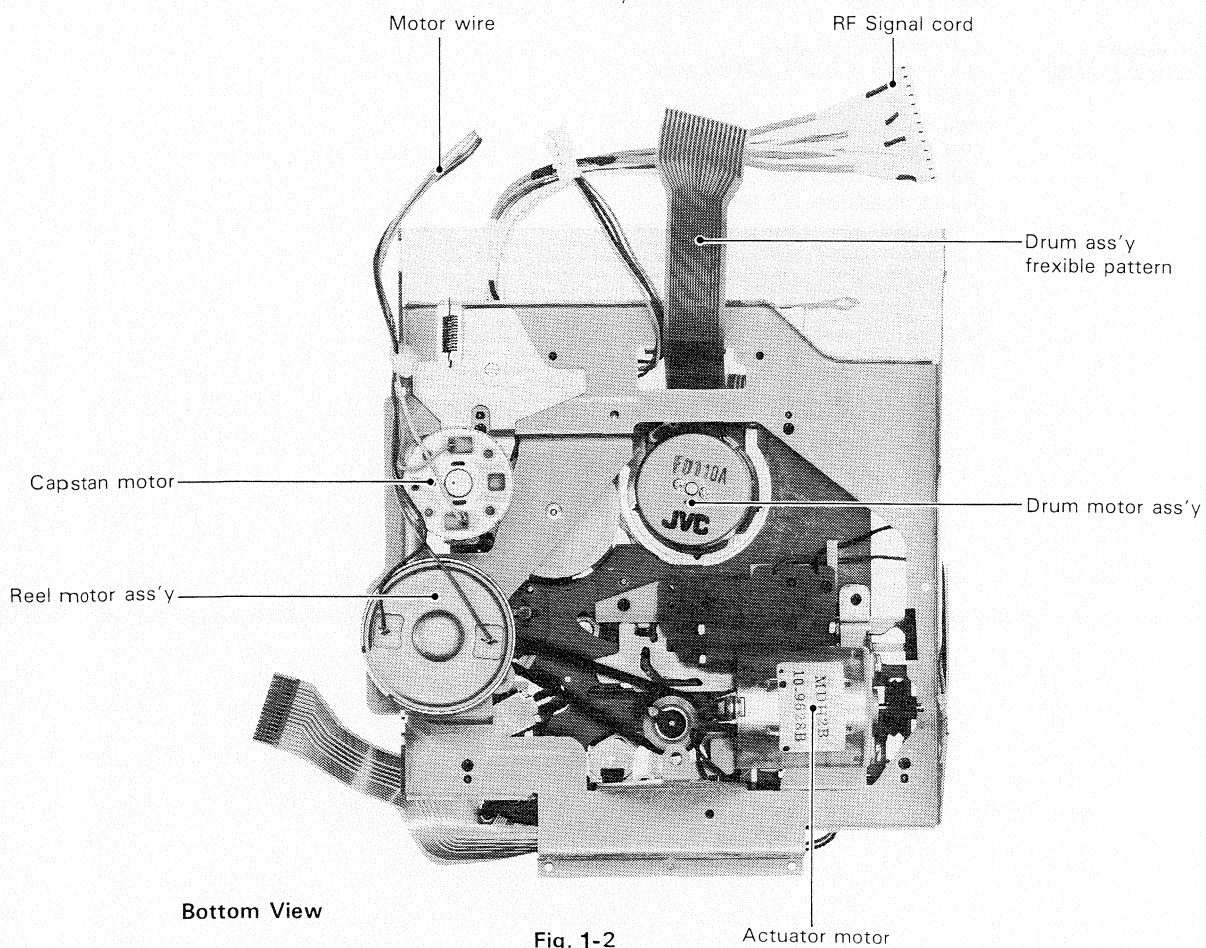


Fig. 1-2

2 Removal of Main Parts

Exterior

■ Upper cover

Remove the 4 screws on the left and right and the 2 screws at the rear.

■ Bottom Plate: See Fig. 2-1

Remove the screw ① at the middle of the front and the 5 screws ② along the edge.

■ Assembly of the Front Panel (Assembly of the Indicator and Front Panel): See Fig. 2-2

1. Take off the knob ③ with the Link from the power switch.
2. Take off the Lid ④ from the mechanism cassette tray plate.
3. Remove the 4 screws ⑤ from the top of the Front Panel.
4. Remove the 2 screws ⑥ attaching the mechanism and the Front Panel Assembly.
5. Remove the 4 screws ⑦ from both sides of the Front Panel Assembly.
6. Remove the screw ⑧ from the Bottom Cover edge center.
7. Remove the screw ⑨ from through the hole at the top center.
8. Remove the screw ⑩ that attaches the earth wire to the right side chassis.
9. The connector of the power supply switch circuit board (CN01).

Remove the wire of the FL board from main board (CN03, CN401), the input level volume wire from main board (CN302) and from input level volume jack board (CN301, and remove the wire to the headphone amplifier from main board (CN303). Then pull at the front surface of the front panel assembly to remove the front panel.

■ Mechanism Assembly: See Fig. 2-3

1. Remove the Upper Cover and remove the 2 screws ⑪ attaching the mechanism bracket to the chassis.
2. Remove the center of the mechanism control board (Servo board).
3. Pull out the mechanism toward the rear.

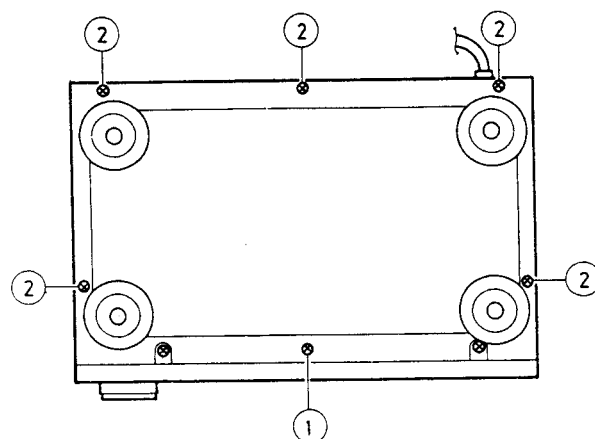


Fig. 2-1

- 1) Remove CN301 from the jack board.
- 2) CN303/CN03/CN401/CN302 of the main board.
- 3) CN01 of the power switch.

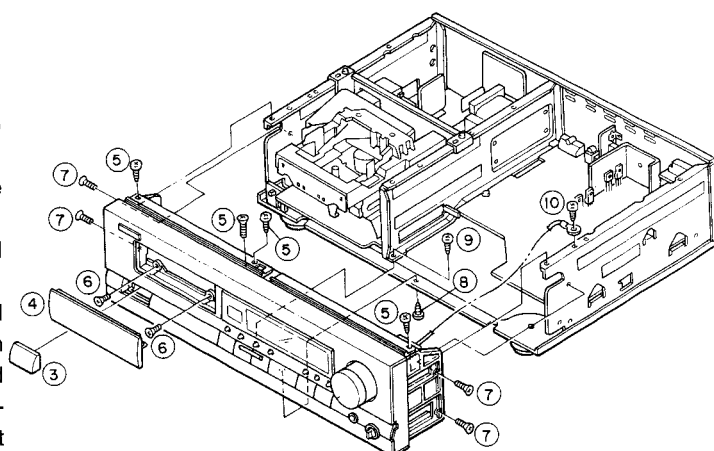


Fig. 2-2

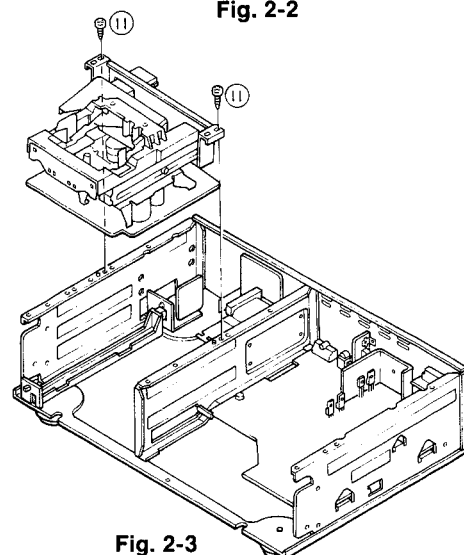


Fig. 2-3

- 1) Remove CN501, CN502 and CN503 from the servo board.

■ Servo Board

It is possible to remove both the mechanism assembly and the servo board assembly simultaneously, or to remove only the servo board assembly. Remove the screw at the front center of the servo board, and remove the connector by lifting it up from the mechanism after sliding the board assembly toward the rear.

■ Front Panel Interior Parts: See Fig. 2-4

Timer switch

Remove the 3 screws (12) attaching the board.

FL board assembly

Remove the 8 screws (13) attaching the board.

Fold the panel up and down it from the top.

Mechanism button

Remove the FL board assembly and 7 screws to remove the button.

Headphone amplifier board assembly

Pull off the headphone volume knob.

Remove the 3 screws (14) attaching the bracket for the headphone jack and volume control.

Input volume assembly

Pull off the input control knob.

Remove the volume control nut.

■ Jack Board (A, B) Assembly: See Fig. 2-5

Remove the screw (15) and (16) from the rear panel.

■ Main Board Assembly: See Fig. 2-5

1. Remove the 7 screws (17), (18), (19), (20) and (21) attaching the jack and heat-sink to the rear panel.
2. Remove the 3 screws (22) attaching the center main board to the center chassis and the left chassis.
3. Lift up the board.

■ Power Supply Transformer: See Fig. 2-6

Remove the power supply connector CN02 from the main board.

Remove the 4 screws (23) with a screwdriver.

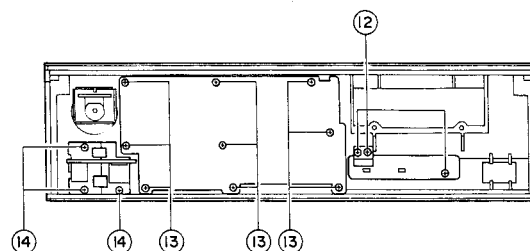


Fig. 2-4

- 1) Remove CN02, CN03, CN401, CN303 and CN302 from the main board.
- 2) CN501, CN502 and CN503 of the servo board.

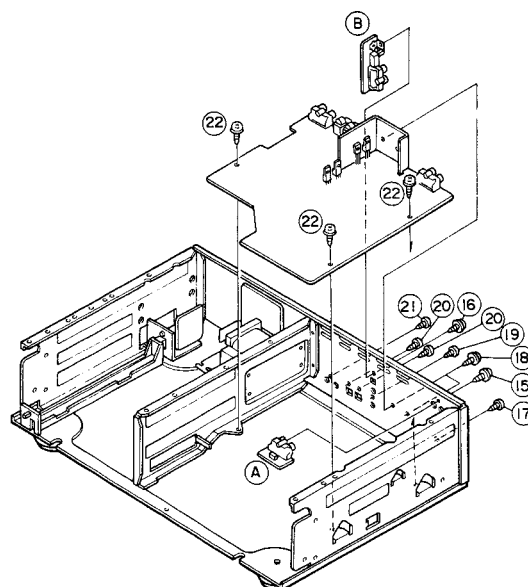


Fig. 2-5

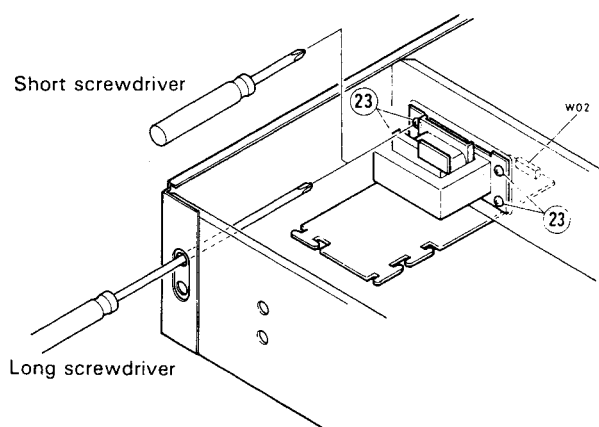


Fig. 2-6

Mechanism Section

[please see detail sheet (Exploded view)]

1. Remove the 2 screws (F15) attaching the mechanism holder.

■ Cassette Compartment Assembly

(cassette loading unit)

1. Rotate the gear and take out the cassette tray toward the front. (arrow in Fig. 2-9)
2. Remove connectors CN552 and CN553 from the left rear of the servo board.
3. Remove the 4 screws (98) of the cassette compartment assembly chassis.
4. Remove the screw attaching the earth wire coming from the RF amplifier case.
5. Remove the cassette compartment assembly.

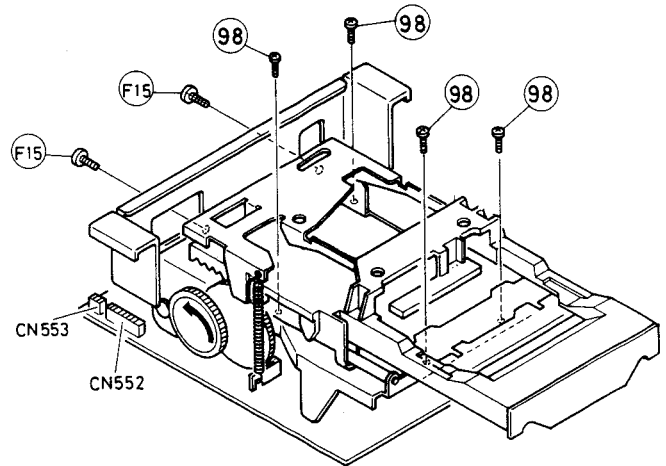


Fig. 2-9

■ RF Board

1. After removing the cassette compartment, you will find the RF assembly attached at the rear of the diecast chassis. Remove the head-flexible connector and the RF board input/output connector.
2. Remove the 2 screws (110) attaching the RF board.

■ How to Remove the Servo Board

Remove wire connectors CN603, CN602, CN601 and CN551 leading to the servo board.

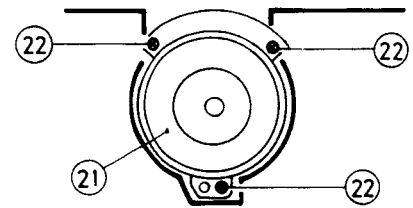


Fig. 2-10

■ Drum Head Assembly (21)

Remove the 3 screws (22) attaching the drum assembly. (When pushing the head cleaner arm away from the drum, the screw under the cleaner can be removed.)

■ Sub-chassis Assembly (15)

1. Remove the drum head assembly (21).
2. Remove the screw (20) attaching the tape guide.
3. Remove the 2 screws (25) and (29) attaching the head cleaner and cleaner base.
4. Remove the C washer (40) attaching the pinch roller assembly.
Then remove the tension spring (44) of the guide roller.
5. Remove the washer (49) attaching the guide post (47). (There is a compression spring (50) under the washer. Make sure not to loose it.)
6. Remove the 3 screws (109) attaching the capstan motor.

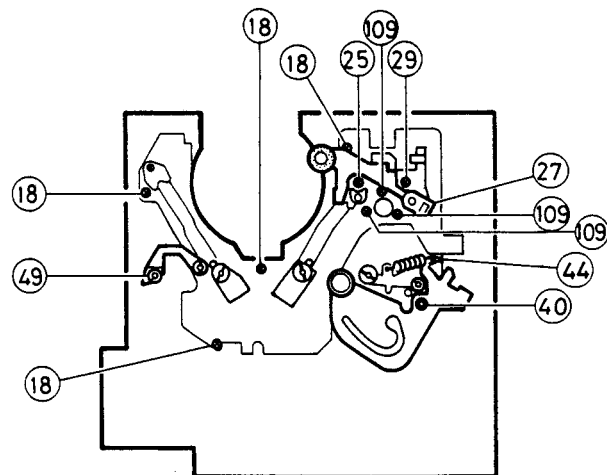


Fig. 2-11

■ Actuator Unit (51)

1. Remove the 3 screws (56).
2. Remove the actuator belt.

■ Reel Disk Unit ⑥0

1. Remove the 2 screws ⑥1 attaching the reel disk unit.
2. Remove the left and right tension threads ⑥4 from the (X) and (X') points of the reel stand chassis.
3. Pull up the reel stand unit. The (Y) point will be obstructed by the mechanism chassis, so pull the reel stand unit upward while moving it back and forth and to the left and right.

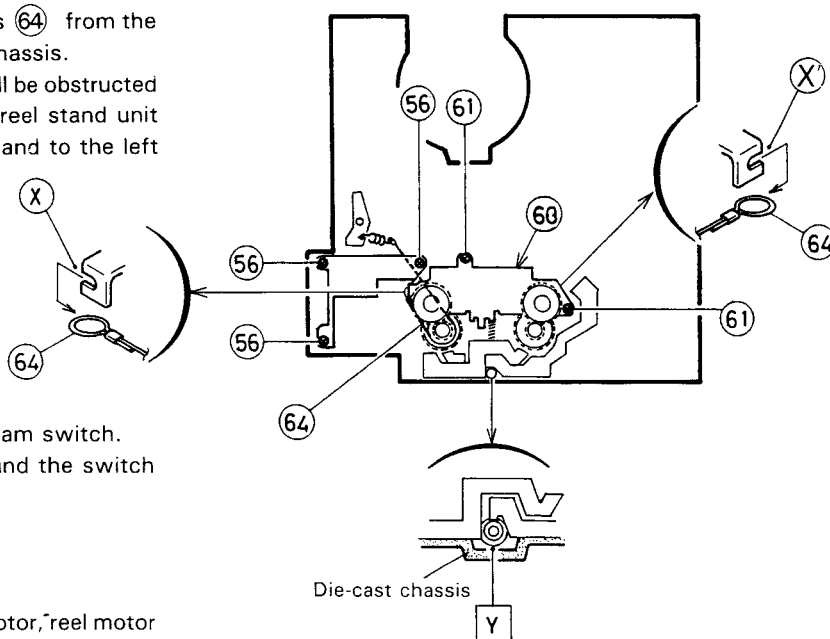


Fig. 2-12

■ Cam Switch Assembly ⑦2

Remove the 2 screws ⑦3 attaching the cam switch. (Make sure to align the assembly switch and the switch guide ⑥8) (black resin).

■ Capstan Motor ⑨0

Remove the capstan motor. (The actuator motor, reel motor and the capstan motor belt can then be removed.)
Remove the screw attaching the motor. (The other motors can be removed in assembled condition).

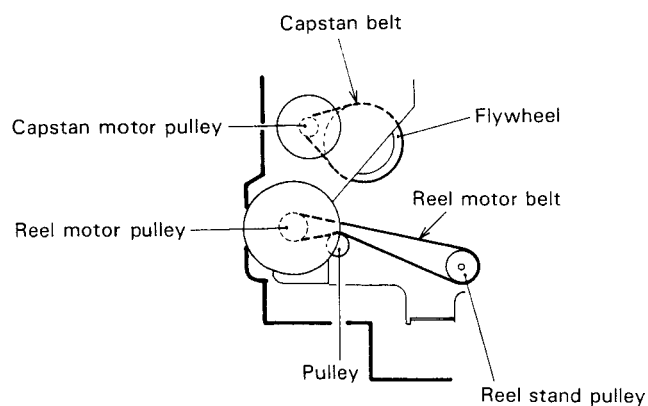


Fig. 2-14

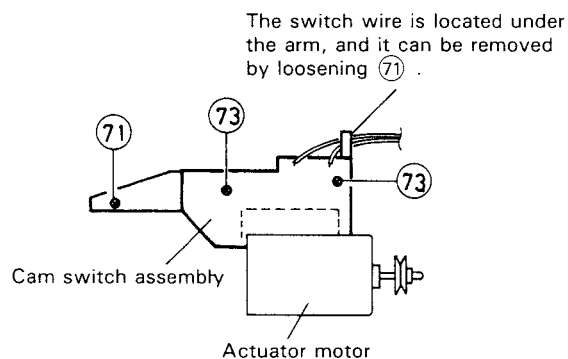


Fig. 2-13

3 IC Block and Pin Functions

■ IC101,IC201
UPC4570HA

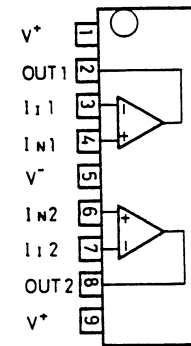


Fig. 3-1

■ IC141,IC241
NJM5532D

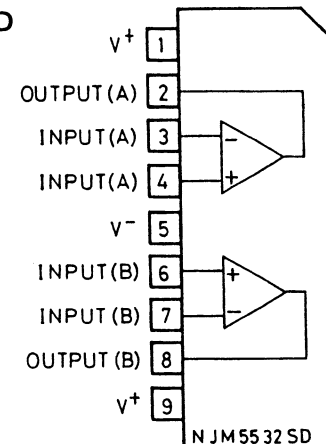


Fig. 3-2

■ IC402,IC403
TC74HCU04AP

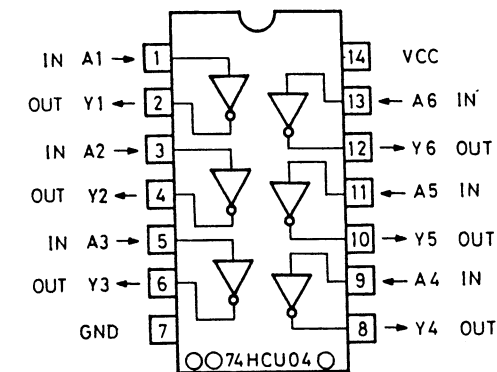


Fig. 3-5

■ IC406
TC74HC02AP

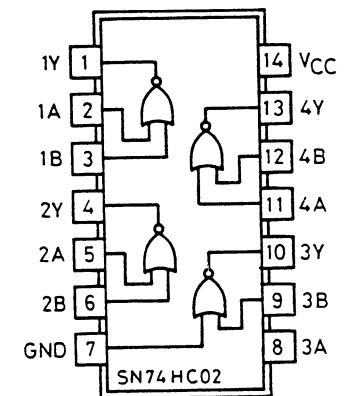


Fig. 3-6

■ IC371
M5218L

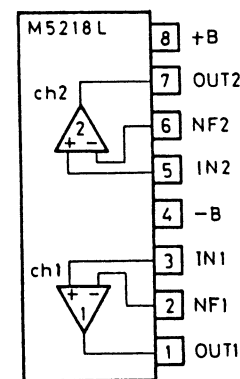


Fig. 3-3

■ IC407
TC74HC74AP

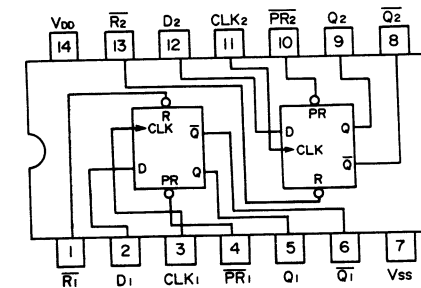


Fig. 3-7

■ IC408
CX23065A

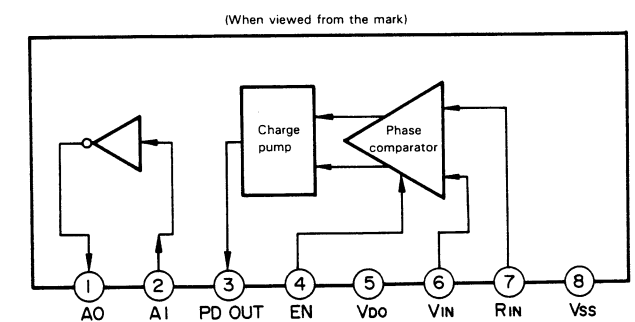


Fig. 3-8

■ ICA01
TA8139F

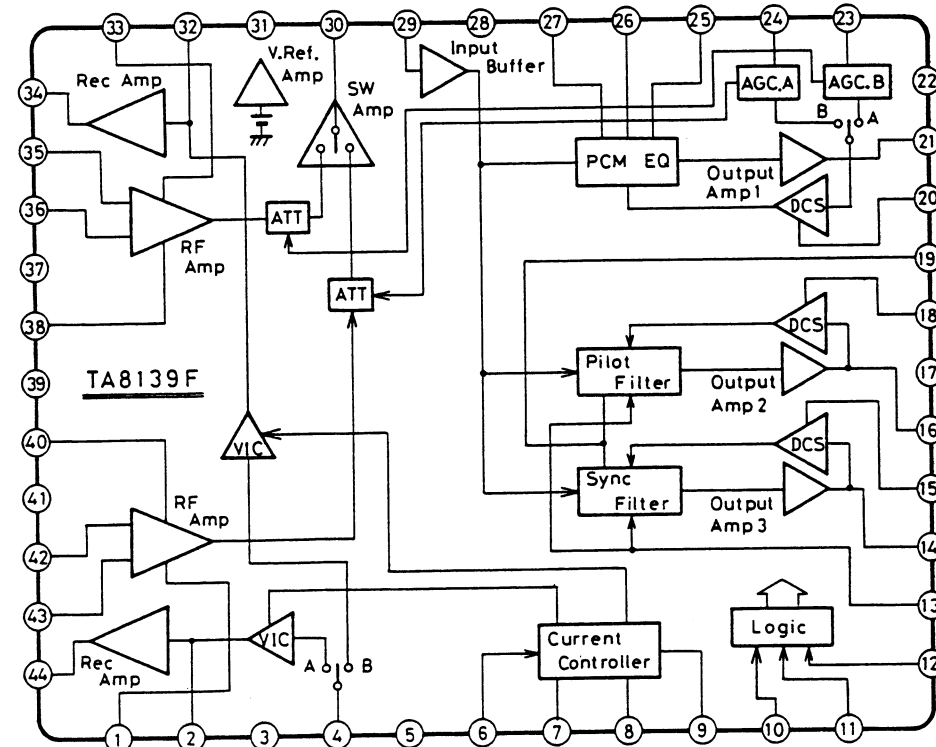


Fig. 3-4

■ IC451
MN1280 (Q)

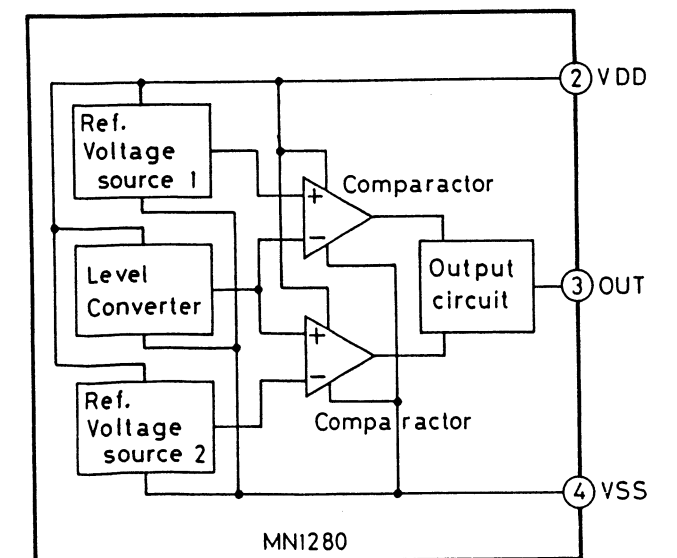
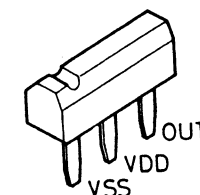


Fig. 3-9

The diagram illustrates the internal architecture of the ADAM-1000 computer system, showing the interconnections between various functional blocks and the external pins. The system is organized into several main sections:

- Input/Output and Memory Interface:** Includes the RAM Interface, I/O data interface, and Level meter circuit, connected to pins 64 through 80.
- Addressing and Control:** Features the Address circuit correction, Correction circuit, and Decision circuit, connected to pins 60 through 52.
- Processing and Data Path:** Contains the ROM, L/N fch, Parity generation, and Synchronized separation circuit, connected to pins 49 through 41.
- Timing and Synchronization:** Includes the Clock generator and NRZ 1 blocks, connected to pins 30 through 25.
- Test and Diagnostic:** Features the TEST 1, TEST 2, TEST 3, and TEST 4 pins, connected to pins 31 through 40.

The diagram shows a complex network of signal lines connecting these internal components to the external pins, which are labeled with their respective functions (e.g., ADCH, ADIN, TEST 3, ADRP, 4BKCS, TEST 2, C9MO, VSS, VDD, TEST 1, CKIN, CKO, TEST 0, EMPH, HDRP, PILOT).

Fig. 3-10

[illegible]

Fig. 3-11

UPD4053BC / 4053BG

Pin	Signal
1	Y1
2	Y0
3	Z1
4	Z
5	Z0
6	INHBIT
7	VEE
8	VSS
9	C
10	B
11	A
12	X0
13	X1
14	X
15	Y
16	VDD

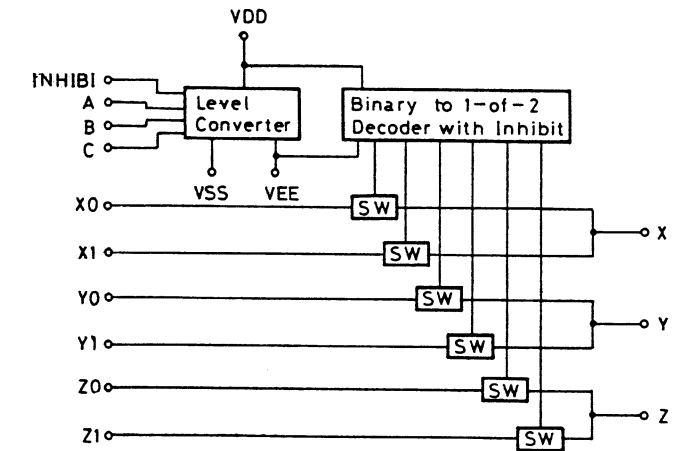
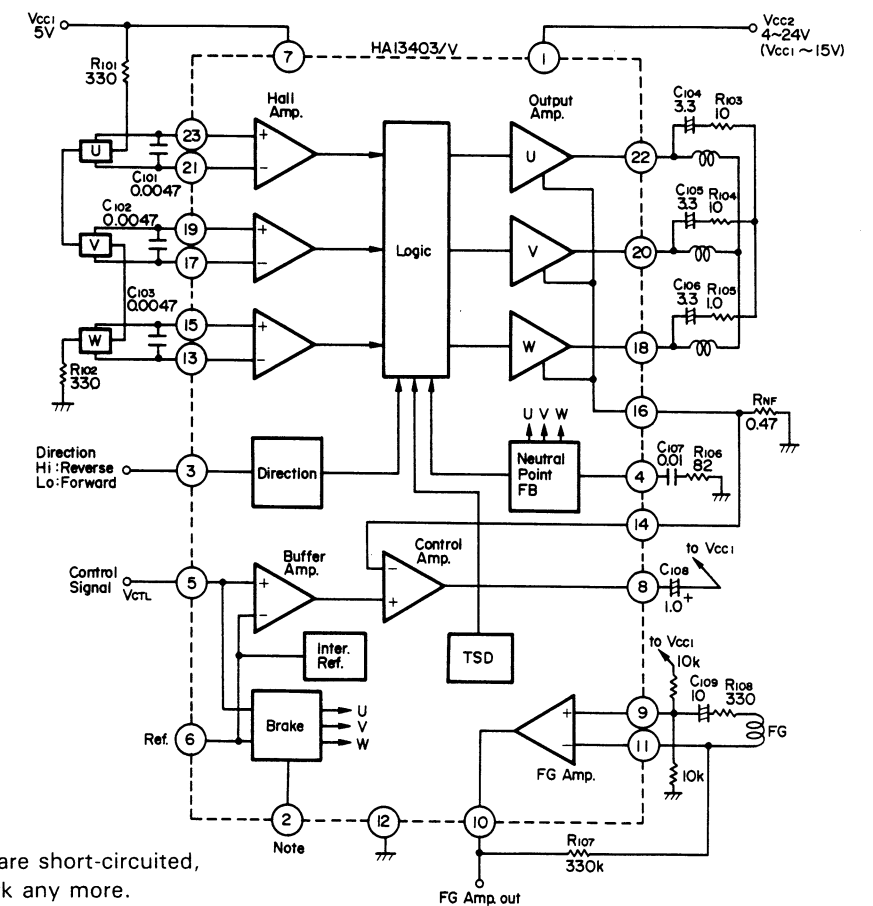


Fig. 3-12

Pin	Function
23	Hall amp. U-phase \oplus input
22	U-phase output
21	Hall amp. U-phase \ominus input
20	V-phase output
19	Hall amp. V-phase \oplus input
18	W-phase output
17	Hall amp. V-phase \ominus input
16	Current detection
15	Hall amp. W-phase \oplus input
14	Control amp. feedback terminal
13	Hall amp. W-phase \ominus input
12	GND
11	FG amp. \ominus output
10	FG amp. output
9	FG amp. \oplus input
8	Phase compensation
7	VCC1
6	Control amp. reference
5	Control amp. input
4	Neutral feedback
3	Forward and reverse selection input
2	Brake terminal
1	VCC2



Note: When the pins ① and ② are short-circuited, the brake circuit will not work any more.

Fig. 3-13

Unit: R: Ω
C: μF

■ IC602, IC604
UPC324G2

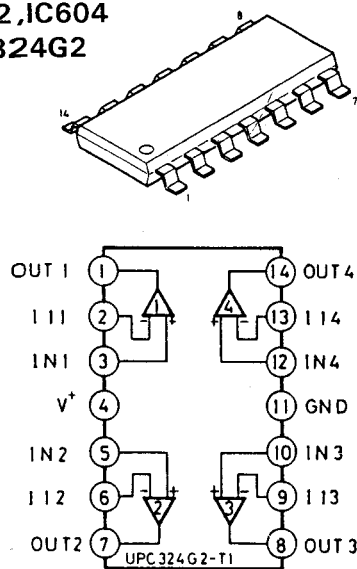


Fig. 3-14

■ IC607
BA6109

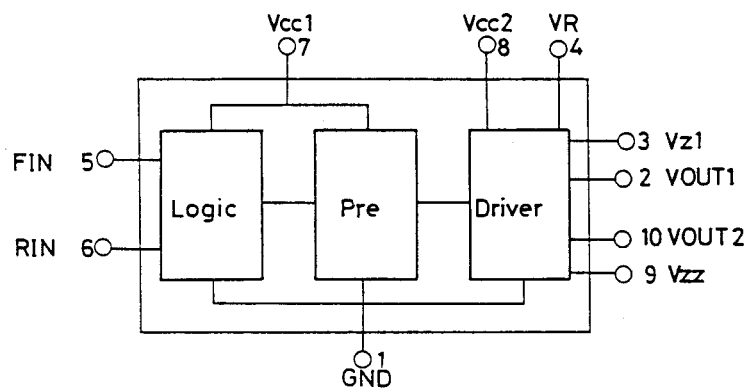


Fig. 3-15

■ IC603
UPC339G2

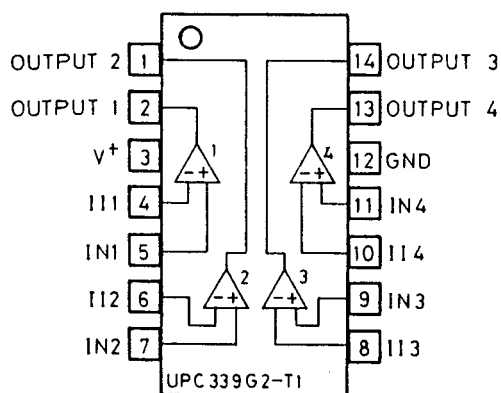


Fig. 3-16

■ IC605
UPD4066BG

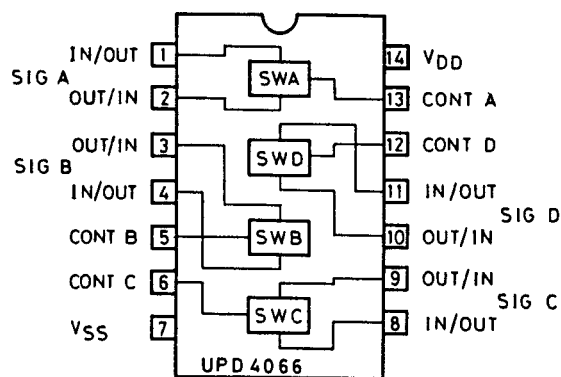
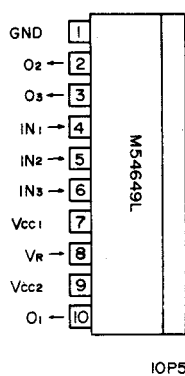


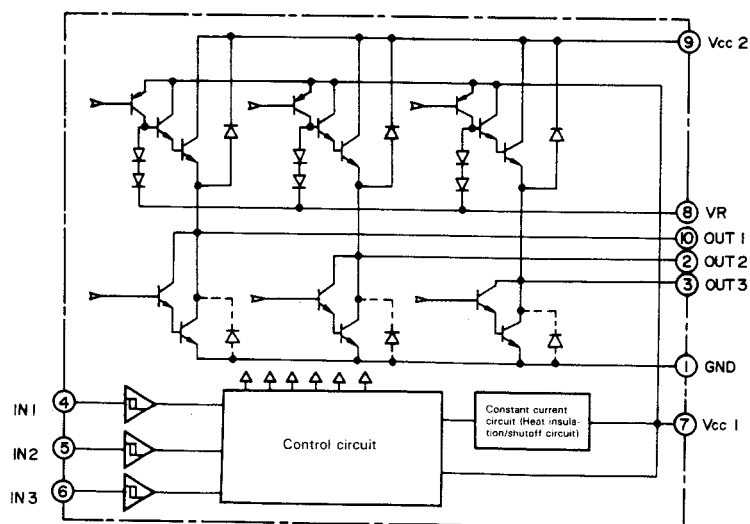
Fig. 3-17

■ IC606, IC552
M54649L



IOP5

Fig. 3-18



4. Terminal functions

Terminal No.	Terminal Name	I/O	Outline of functions
1	192FS	O	192 fs (8.4672 MHz) clock
2	LRPOL	I	Selection of the polarity of LRCLK. SRDATA is Lch where LRCLK = "H" at the time of "H".
3	LRCLK	I	Lch-Rch select signal of SRDATA.
4	BCLK	I	SRDATA shift clock (rising/startup)
5	SRDATA	I	Serial data
6	DVSS	—	Digital system gland
7	384FS	O	384 fs (16.9344 MHz) clock
8	MDATA	I	attenuator data
9	MCLK	I	MDATA shift clock (rising)
10	MLD	I	MDATA latch signal (rising)
11	RST	I	Reset signal. Resetting with "L".
12	IE	I	Selection of SRDATA format. Normally, it is set to "L".
13	TPI	O	Test output of digital filter section
14	TP2	O	
15	TEST1	I	Test input of digital filter section
16	DVDD	—	For fixing internal column potential.
17	TEST2	I	Digital filter section test input
18	NC		
19	NC		
20	NC		
21	AVDD1	—	Analog system (Rch) power supply
22	OUT RC	O	Rch output C
23	OUT RD	O	Rch output D
24	OUT RB	O	Rch output B
25	OUT RA	O	Rch output A
26	AVSS1	—	Analog system (Rch) gland
27	NC		
28	AVSS2	—	Analog system (Lch) gland
29	OUT LA	O	Lch output A
30	OUT LB	O	Lch output B
31	OUT LD	O	Lch output D
32	OUT LC	O	Lch output C
33	AVDD2	—	Analog system (Lch) power supply
34	DVDD1	—	Digital system (clock and timing generator section) power supply
35	DVSS1	—	Digital system (clock and timing generator section) gland
36	X2	O	X'tal oscillation
37	X1	I	... 384 fs (16.9344 MHz)
38	DVSS2	—	Digital system gland
39	NSUB	—	For fixing internal NSUB potential
40	DVDD2	—	Digital system power supply
41	NC		
42	ZFLG	O	Detection of "0" of input data ("L" at the time of "0")

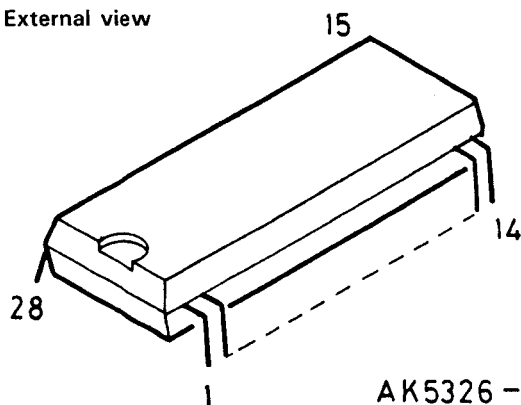
■ AK5326 (IC301) A/D converter

1. General description

This AK5326 is an A/D conversion system compatible to the stereo digital audio system. As a 16 bit 2 channel stereo A/D conversion system, this system is designed to perform simultaneous sampling, A/D conversion, repetitive noise filtering, and serial output of left and right input channel conversion data. The output data rate is 50 kHz in maximum per channel.

The AK5326 realized a high performance A/D conversion system using a delta and sigma modulation system. Over-sampling makes it possible to drastically simplify the external cyclical noise preventive filter by means of digital filter and decimation. By sampling at 64 times the output data rate, a highly excellent dynamic characteristic of as much as $S/(N + D) = 92$ dB is attained in the entire band zone by means of the 3 stage digital FIR filter. The FIR filter has a pass band of 0.001 dB at linear phase and a blocking band attenuation rate of 86 dB or more.

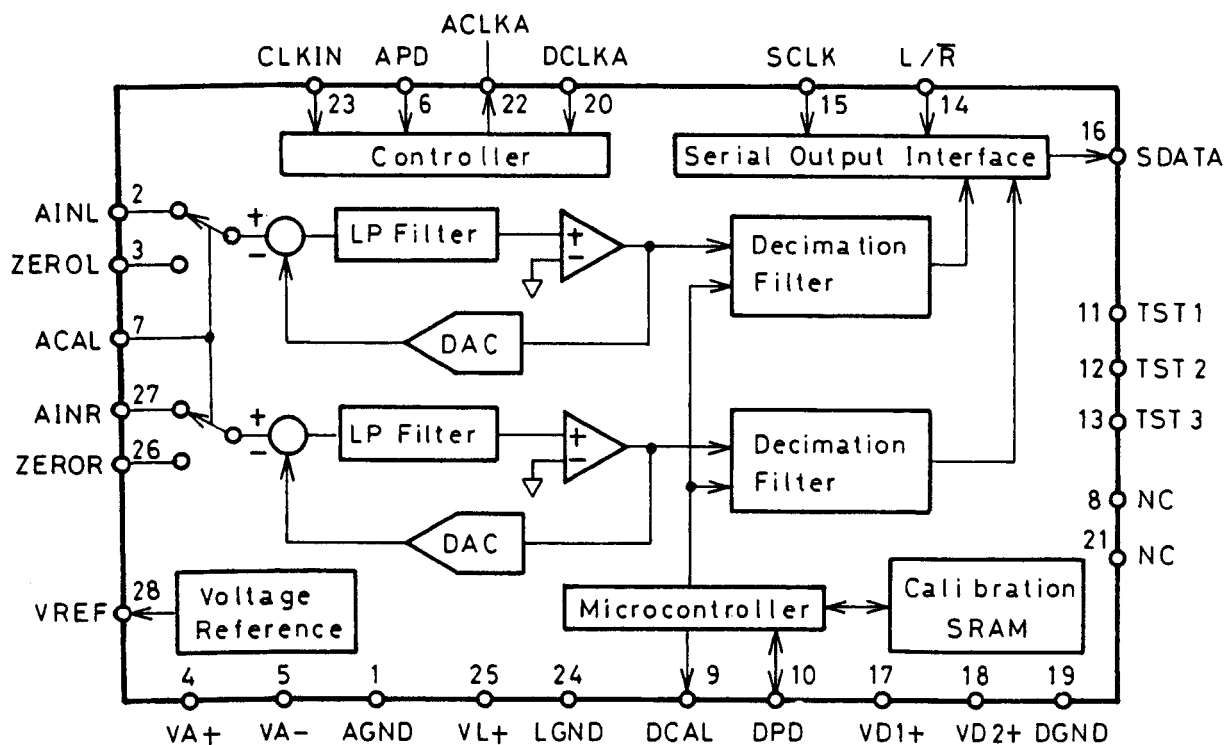
2. External view



AK5326 - VP

1. AGND	8. NC	15. SCLK	22. ACLKA
2. AINL	9. DCAL	16. SDATA	23. CLKIN
3. ZEROL	10. DPD	17. VD 1 +	24. LGND
4. VA+	11. TEST 1	18. VD 2 +	25. VL+
5. VA-	12. TEST 2	19. DGND	26. ZEROR
6. APD	13. TEST 3	20. DCLKA	27. AINR
7. ACAL	14. L/R	21. NC	28. VREF

3. Internal block diagram



4. Terminal functions

Terminal No.	Terminal Name	I/O	Outline of functions
1	AGND	—	Analog gland terminal
2	AINL	I	L channel analog input terminal. The full scale input voltage is ± 3.68 V. It is recommended to connect a $0.001 \mu\text{F}$ or larger condenser between AGND.
3	ZEROL	I	L channel zero level input pin. After setting the input voltage of this terminal normally to zero level, perform calibration of the offset of L channel. Normally, this pin should be connected to the AGND pin.
4	VA +	—	Positive analog power supply: +5 V
5	VA -	—	Netative analog power supply: -5 V
6	APD	I	Analog pwer down terminal. When this terminal is at a high level, the mode is set to "POWER DOWN". Normally, this terminal is connected to the DPD pin.
7	ACAL	I	Analog calibration terminal. Normally, this terminal is connected to the DCAL terminal. When this terminal is at a high level, the L/R input channel is connected internally to the zero level input terminals. (ZERO L and ZERO R), respectively. When at a low level, this terminal is connected to the analog input terminals (AIN L and AIN R).
8	NC	—	Unconnected terminal
9	DCAL	I	Digital calibration terminal. Normally, the signal from this terminal is used as an input signal to the ACAL terminal. When "POWER DOWN" signal has been input to the DPD pin, this terminal rises immediately, and is set to the low level after a period of 4096 L/R (about 85 ms at 6.144 Hz) from coming-down of DPD pin. Then, the end of offset calibration is indicated. In the case of performing system calibration, moreover, this terminal can be used to input the channel selection signal from the external MUX.
10	DPD	I	Digital "POWER DOWN" terminal When this terminal is at a high level, the mode is set to "POWER DOWN". After making of power supply, be sure to perform calibration once by inputting positive pulse to this terminal.
11	TST1	I	Test terminal connect this terminal to the DGND terminal.
12	TST2	I	
13	TST3	I	
14	L/R	I	Input channel selection terminal This terminal is used to select the channel of data being output from the SDATA terminal. When the level is high, the data of L channel is output, but when the level is low, the data of R channel is output. The clocks divided into 128 from the master clock are input from this terminal.
15	SCLK	I	Serial data output clock terminal When the clock has risen (has been started up), the output data is changed by 1 bit. Normally the data is input by dividing the master clock to 4.
16	SDATA	O	Serial data output terminal The data is output successively from MSB after complementing 2's. When SCLK has risen, one bit of data is output. Moreover, the low level data is output when 17 or more SLKs are input.
17	VD1 +		Positive digital power supply: +5 V
18	VD2 +		
19	DGND		Digital grand terminal
20	DCLKA	I	Digital system clock terminal. This terminal is connected to the ACLKA terminal.
21	NC	—	Unconnected terminal.
22	ACLKA	O	Master clock terminal. This terminal is connected to the DCLKA terminal. The clocks divided into 2 from the master clock will be output.
23	CLKIN	I	Analog system clock terminal. This clock wihich has been divided into 2 constitutes a sampling rate of delta and sigma modulator., When the clock is at 6.144 MHz, the output word rate ped channel becomes 48 kHz.
24	LGND	—	Digital gland terminal.
25	VL +	—	Digital power supply: +5 V.
26	ZEROR	I	R channel zero level input terminal. Generally, the R channel offset is calibrated after setting the input voltage of this terminal to zero level. Normally, this terminal should be connected to the AGND terminal.
27	AINR	I	R channel zero level input terminal. The full scale input voltage is ± 3.68 V. It is recommended to connect $0.001 \mu\text{F}$ or larger condenser between AGND.
28	VREF	O	Reference voltage source: -3.68 V. Normally, a $6.8 \mu\text{F}$ electrolytic condenser and a ceramic condenser should be connected in parallel between AGND.

■ CF78120APH (IC401) Digital I/O

1. Main function of this LSI
- (1) A clock constituting a basis of the overall system is formed.

(2) Decoding of digital input signal

(3) Encoding of digital I/O signal

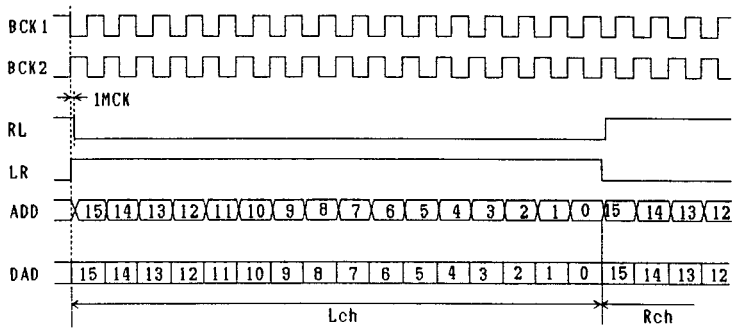
(4) Interface between AD/DA converter and signal processing LSI

(5) Counting of block errors

(6) Communication with microcomputer

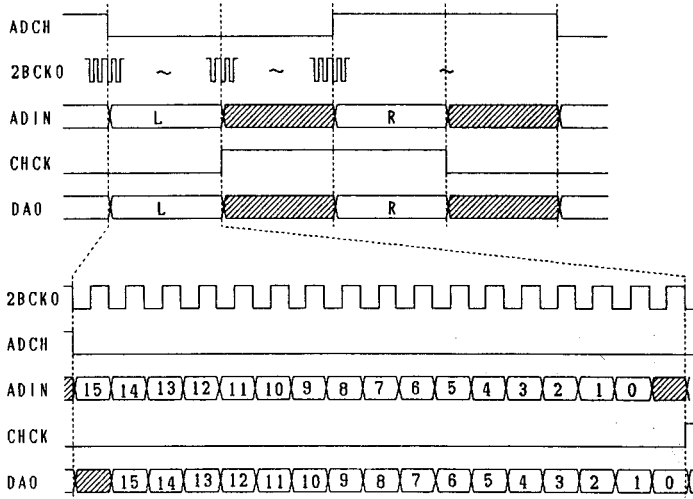
2. Main timing

(1) Related to AD and DA



ADC/DAC timing chart

(2) Related to LSI



3. Terminal functions

#	Terminal Name	I/O	Function	Connect to:
1	GND			
2	XS1	O	"OPEN" at 48 K/32 K mode, but "L" otherwise. Crystal oscillation circuit for 48 K/32 K mode	XTAL1
3	XI1	I		"
4	XO1	O		"
5	GND			
6	XS2	O	"OPEN" at 44 K mode, but "L" otherwise.	XTAL2
7	X12	I		"
8	XO2	O		"
9	GND			
10	MCK1	O	Master clock of DAC	DAC

#	Terminal Name	I/O	Function	Connect to:
11	GND			
12	MCK2	O	Master clock of DAC	NC
13	128F	O	Master clock (128Fs) for ADC	AD
14	ADD	I	ADC output data	"
15	BCK2	O	ADC bit clock	"
16	LR	O	ADC channel clock (Fs)	"
17				
18	LPF	O	DAC action mode ('L' at 32 K)	DAC
19	DAD	O	DAC data	"
20	BCK1	O	DAC bit clock (32Fs)	"
21	RL	O	DAC channel clock (Fs)	"
22	384F	O	DAC master clock (384 Fs)	NC
23	DEMP	O	De-emphasis signal	DAC
24	INVI	I	NOT gate input	(Not used)
25	INVO	O	NOT gate output	NC
26	MOD0	I	Test terminal	+ 5
27	MOD1	I	"	"
28	MOD2	I	"	"
29	MOD3	I	"	"
30	TSP1	O	"	"
31	TX	O	Digital output	OUTPUT
32	MCLR	I	Reset at 'L'	RESET
33	VCC			
34	RX1	I	Digital input (optical)	INPUT
35	RX0	I	Digital input (coaxial)	INPUT
36	VCE	O	Signal selecting RX0 and RX1	MN
37	MN	I	Signal delaying VCE by as much as 60 n	VCE
38	METCLK	I	Level data communication clock for meter	D. μ COM
39	METEN	I	Level data communication 'enable' signal for meter	"
40	METD	O	Level data communication data for meter	"
41	MSCLK	I	Clock for mechanical control communication data	MECHACON
42	MSDATA	I	Input data for mechanical control communication data	"
43	SMDATA	O	Output data for mechanical control communication data	"
44	MSEN	I	'Enable' for mechanical control communication data	"
45	PMUTE	I	Muting of audio replay (reproduction) data	"
46	COHD	I	Signal processing frame identification signal	TC9225AG
47	SSYNC	I	Synchronized communication signal between signal processing LSIs	"
48	SPCD1	I	Communication data between signal processing LSIs	"
49	DAO	I	Reproduced data from signal processing LSI	TC9226F
50	2BCKO	I	Bit clock for DAO (98 Fs or 32 Fs)	"
51	CHCK	I	Channel clock DAO (Fs)	"
52	ADIM	O	Recording data to signal processing LSI	"
53	ADCH	I	Channel clock for ADIN (Fs)	"
54	CK3M	I	Clock for SSYNC (3.136 MHz)	"
55	MONION	I	Inversion and non-inversion control of ADCH (Inversed at 'H' and not inversed at 'L')	MECHACON
56	GND			
57	MI	O	Test terminal	
58	SE	O	Test terminal	
59	SK	I	PLL action setting ('L')	
60	SI	I	PLL action setting ('L')	
61	CO	I	PLL action setting ('H')	
62	UNLOCK	O	Unlocking of digital input PLL	
63	VCOI	I	VCO clock input	VCOOUT
64	VCOEN	O	VCO stop signal (Oscillated at 'L')	INHIBIT
65	AGND			
66	INHIBIT	I	VCI stop signal (Oscillated at 'L')	VCOEN
67	VCOOUT	O	VCO clock output	VCOI
68	C1	AN	VCO oscillation frequency setting	68pF
69	R2	AN	VCO oscillation frequency setting	220k Ω
70	VCOin	AN	VCO control voltage	LPF
71	R1	AN	VCO oscillation frequency setting	3.3k Ω
72	AVCC			
73	VCC			
74				
75	PD2	3S	ADCH and RL phase comparator output	LPF
76	PD1	3S	Phase comparator output of digital input PLL	"
77	GND			
78	DCSR	O	Signal extracting MSB from ADD (R)	ADC
79	DCSL	O	Signal extracting MSB from ADD (L)	"
80	VCC			+ 5

■ HD614023SA55 (IC801) Display Microcomputer

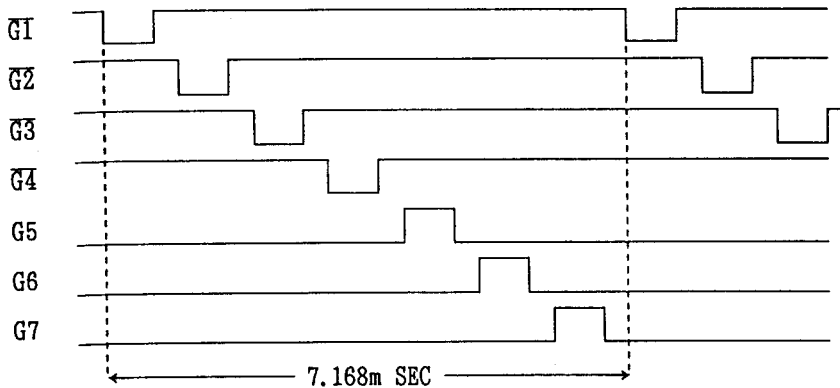
I. Functions of display microcomputer

- (1) Key scanning, decoding of remote control input, computer link communication, and sending of the outputs over to mechanical controller.
- (2) Receiving of display data from mechanical controller and display on the FL tube.
- (3) Receiving of level data from digital I/O-IC, and display on meter after executing peak recovery and digital peak processing.

2. Processing Timing

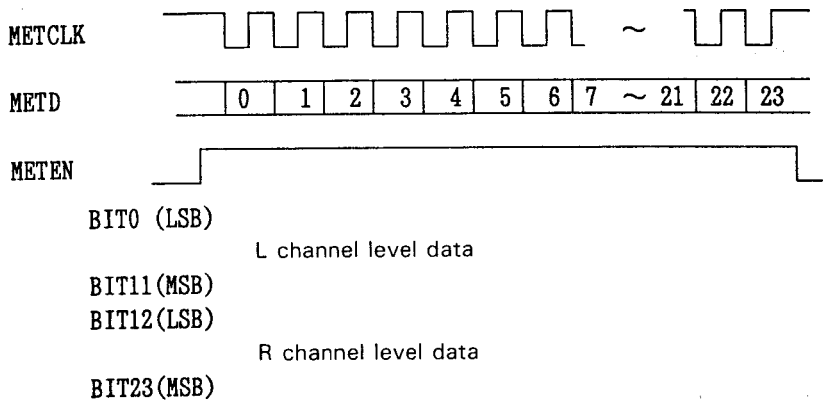
(1) FL display timing

G1 ~ G4 and G5 ~ G7 are under dynamic scanning respectively by 7 grids of negative logic and those of positive logic.



(2) Digital I/O-IC communication timing

METD, METEN and METCLK are the communication lines for receiving meter display data through communication with the digital I/O-IC and have the following formats. Meanwhile, the communication period is about 7 msec.



(3) Communication timing between microcomputers

DMDDATA, MDDATA and MDCLK are the communication lines between the mechanical controllers, and have the communication formats with one set of data consisting of 1 bite (8 bits) and 15 bites per about 2 msec.

3. Terminal functions

#	Terminal Name	I/O	Function	Connect to:
1	A5	O ↓	Anode output of FL tube	FL
2	A6	O ↓	"	"
3	A7	O ↓	"	"
4	A8	O ↓	"	"
5	A9	O ↓	"	"
6	A10	O ↓	"	"
7	A11	O ↓	"	"
8	A12	O ↓	"	"
9	A13	O ↓	"	"
10	A14	O ↓	"	"
11	A15	O ↓	"	"
12	A16	O ↓	"	"
13	A17	O ↓	"	"
14	A18	O ↓	"	"
15	A19	O ↓	"	"
16	A20	O ↓	"	"
17	A21	O ↓	"	"
18	NC	I		
19	V _{disp}	I	Common for pulldown resistor (– 24 V)	Power supply
20	TPLY	I ↑	Timer reproduction switch (ON at 'L')	SW
21	TREC	I ↑	Timer recording switch (ON at 'L')	"
22	COA/OPT	I ↑	Select switch to and from coaxial and optical	"
23	REM	I	Remote controller	Remocon
24	STD/LONG	I ↑	Mode select switch at the time of recording mode	SW
25	ANA/DIG	I ↑	Recording mode select switch (Analog at 'L')	"
26	NC	I ↑		
27	METD	I	Meter data from digital I/O-IC	SCA
28	NC	I ↑		
29	METEN	O ↑	Set to 'H' when communicating with digital I/O-IC.	"
30	METCLK	O ↑	Communication clock with digital I/O-IC	"
31	NC	I ↑		
32	VCC	I ↑		
33	MDCLK	I ↑	Mechanical control communication shift clock input	MECHACON
34	MDDATA	I ↑	Mechanical control communication input	"
35	MDMDATA	O	Mechanical control communication output	"
36	DCSI	O ↑	RC-5 input	DCS
37	DCSO	O ↑	RC-5 output	DCS
38	NC	I ↑		
39	NC	I ↑		
40	NC	I ↑		
41	KO0	O ↑	Key scan output	KEY
42	KO1	O ↑	"	"
43	KO2	O ↑	"	"
44	KO3	O ↑	"	"
45	KI0	I ↑	Key scan input	"
46	KI1	I ↑	"	"
47	KI2	I ↑	"	"
48	KI3	I ↑	"	"
49	RESET	I	Resetting terminal	
50	TEST	I	Fixed at 'H'	
51	OSC1	I	Ceramic oscillator (4 MHz)	Oscillator
52	OSC2	O	"	"
53	GND			
54	G1	O	Grid output of FL tube (High tension resistant buffer is installed outside)	FL
55	G2	O	"	"
56	G3	O	"	"
57	G4	O	"	"
58	G5	O ↓	Grid output of FL tube	"
59	G6	O ↓	"	"
60	G7	O ↓	"	"
61	A1	O ↓	Anode output of FL tube	"
62	A2	O ↓	"	"
63	A3	O ↓	"	"
64	A4	O ↓	"	"

*1: The I/O unit denoted by ↑ refers to the port with pullup resistor and that denoted by ↓ refers to that with pulldown resistor.

■ UPD75112CW-075 (IC551) Mechanical control microcomputer

1. Mechanical control functions

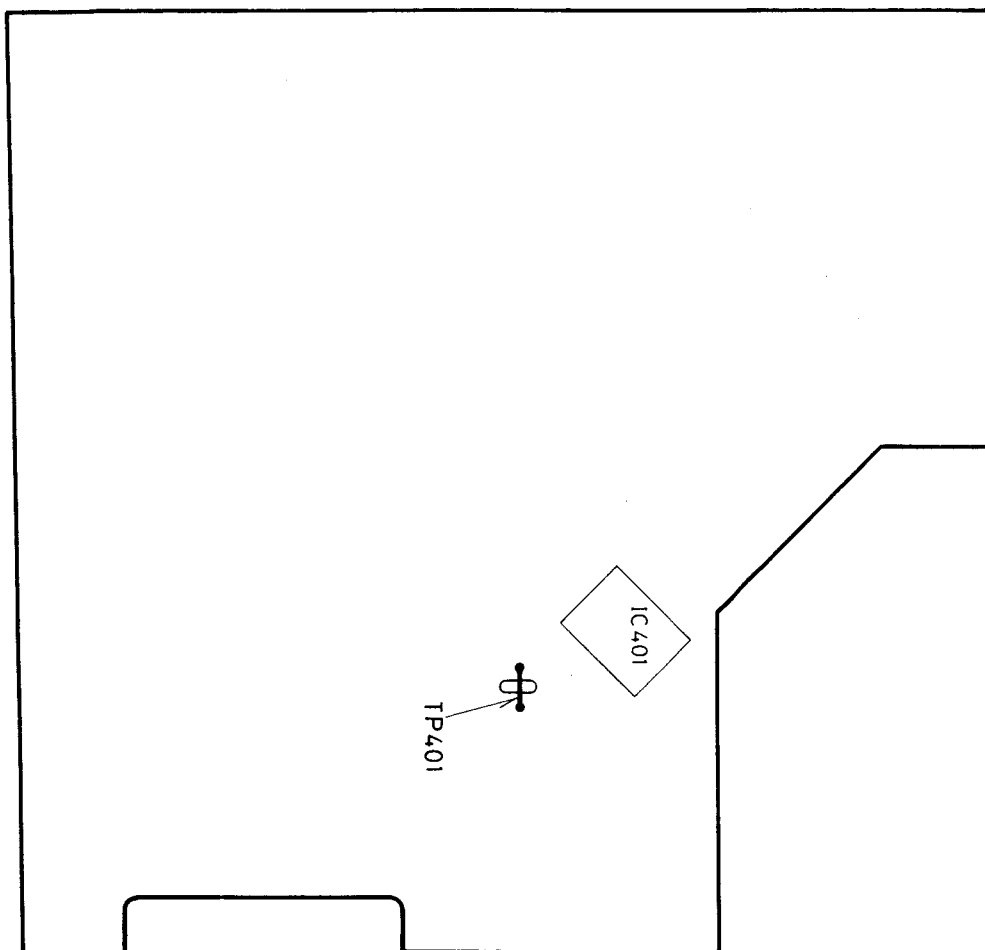
- (1) The mechanical control, microcomputer is designed to control the overall system based on the key data from the display microcomputer.
- (2) The following items are performed through communication with the signal processing LSI:
 - ① Mode setting
 - ② Servo control
 - ③ Recording and replay (reproduction) of subcode
- (3) The following items are executed through communication with the digital I/O-IC:
 - ① System mode setting
 - ② Digital I/O control
- (4) Mechanical action control

#	Terminal Name	I/O	Function	Connect to:
1	TREEL	I	Takeup side reel pulse (8 pulses per revolution)	REEL SENS.
2	SREEL	I	Supply side reel pulse (8 pulses per revolution)	"
3	SWP	I	Head identification signal	TC9225AG
4	COHD	I	LSI synchronizing signal	TC9225AG
5	TEST2	AN	Automatic measurement test mode setting terminal (Normally at 'H')	
6	MPOS	AN	Mechanical mode detection switch input	SW
7	EOT	AN	Judging EOT (End of Tape) at 1 V or less.	EOT SENS.
8	BOT	AN	Judging BOT (Begin of Tape) at 1 V or less.	BOT SEND.
9	POFF	I	Set to 'L' instantaneously at the time of POWER OFF	Power circuit
10	CFG	I	Capstan FG (for detecting position after and during recording)	CAPSTAN SV
11				
12				
13				
14				
15	DMDATA	I	Communication data from display microcomputer	DISP. μ COM
16	MDDATA	O	Communication data to display microcomputer	"
17	MDCLK	O	Communication clock to display microcomputer	"
18				
19	TEST1	I \uparrow	It becomes possible to display the error rate at the time of 'L'.	
20	TEST0	I \uparrow	It becomes possible to reproduce MOT-12 and other irregular (abnormal) signals at the time of 'L'.	
21	ID4	I \uparrow	Set to 'H' at the time of 'L'.	MECHA-SW
22	WP	I \uparrow	Recording is impossible at the time of 'L'.	MECHA-SW
23	EEND	I \uparrow	End of tray ejection at the time of 'L'	TRAY-SW
24	LEND	I \uparrow	End of tray loading at the time of 'L'	TRAY-SW
25	CASSW	I \uparrow	Cassette loaded at the time of 'L'	MECHA-SW
26	KICK-EN	I \uparrow	Detecting entry of ATF into dummy lock at the time of "LP - PLAY"	SERVO
27	MTC	O	Control of CAM (ACTUATOR) MOTOR and TRAY MOTOR.	MOTOR.DRIVE
28	MTB	O	"	"
29	MTA	O	"	"
30	CAS/CAM	O	"	"
31	NC			+5
32	VDD			+5

#	Terminal Name	I/O	Function	Connect to:
33	MSCLK	O	Communication clock to digital I/O-IC	DIGITAL IO
34	MSDATA	O	Data to digital I/O-IC	"
35	SMDATA	I	Data from digital I/O-IC	"
36	MSEN	O	Communication enable signal with digital I/O-IC	"
37	FPSEL	O	This terminal is set to 'L' during 1.5 turns of drum at the time of starting FF/REW.	SERVO
38	MONION	O	This terminal is set to 'H' during reproduction (replay) under recording or LP model.	DIGITAL IO
39	AMUTE	O	Muting of audio signal	AUDIO
40	DMUTE	O	Muting of digital out (output)	DIGITAL IO
41		I		
42		I		
43		I		
44		I		
45	RESET	I	Resetting at 'L'.	RESET
46	X2	I		
47	X1	O		
48	ATF-KICK	O	Kicking to 'H' after detecting dummy lock with KICK-EN	
49	FF	O	Set to 'L' when in the direction of FF.	
50	RLSV	O	Set to 'L' at the time of high speed search (FF/REW)	
51	RLONSH	O	Set to 'L' for 80 msec. after rising of TREEL pulse	SERVO
52	CAPDIR	O	Rotating direction of capstan motor (forward at 'L')	"
53	CAPON	O	The capstan motor is rotated at 'L'.	"
54	SOLO	O	The brake solenoid is pulled at 'L'.	"
55	DRVCTL	O	The power supply voltage to various motor drivers is controlled.	Power supply circuit
56				
57				
58	CSYNC	O	Set to 'L' when command is sent at the time of communication with TC9225AG.	TC9225AG
59	DCK	O	Communication clock with signal processing LSI (TC9225AG).	"
60	μ DATA3	I/O	"	"
61	μ DATA2	I/O	"	"
62	μ DATA1	I/O	"	"
63	μ DATA0	I/O	"	"
64	Vss			GND

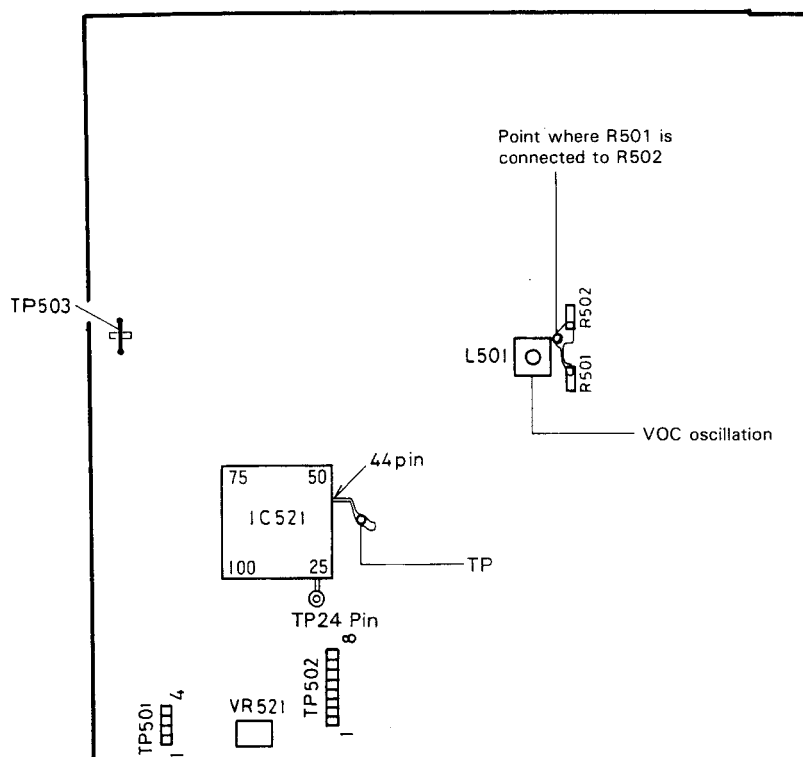
4 Locations to be Adjusted

■ Main P.C.B.

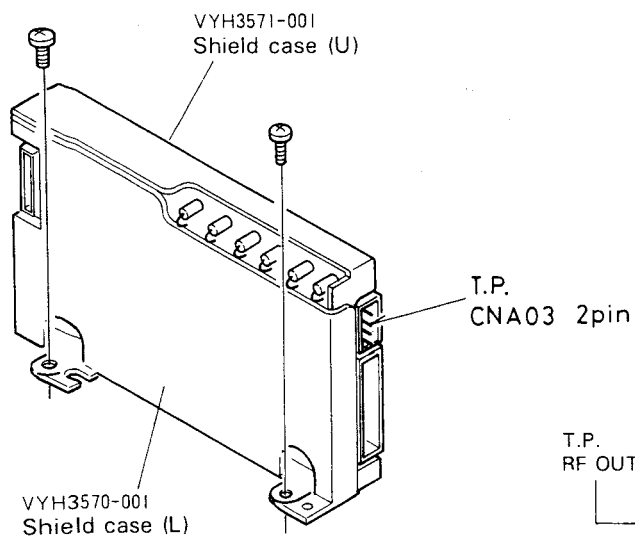


■ Servo P.C.B.

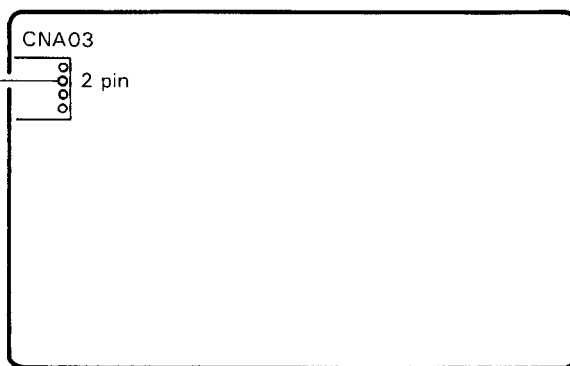
(Pattern side)



■ RF P.C.B.



T.P.
RF OUT



5 Mechanism Adjustments

Measuring Tapes

MOT-0	4822 397 30232
MOT-1	4822 397 30233
MOT-2	4822 397 30235
MOT-12	4822 397 30234
MOT-3S	4822 397 30236

Measuring Equipment

Digital oscilloscope with bandwidth of more than 100 MHz
Tension gauge

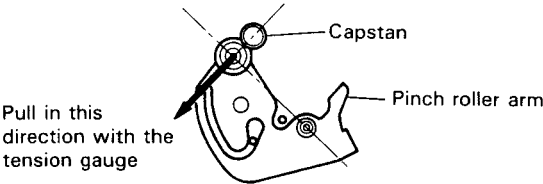
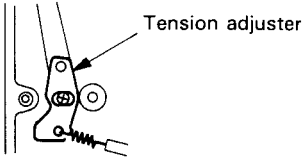
Torque gauge (DT-13)	4822 397 30231
Screwdriver (DT-V66)	4822 395 50415

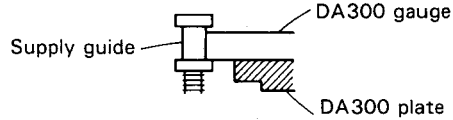
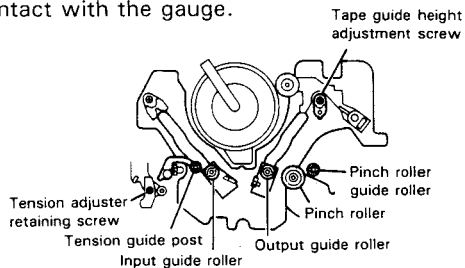
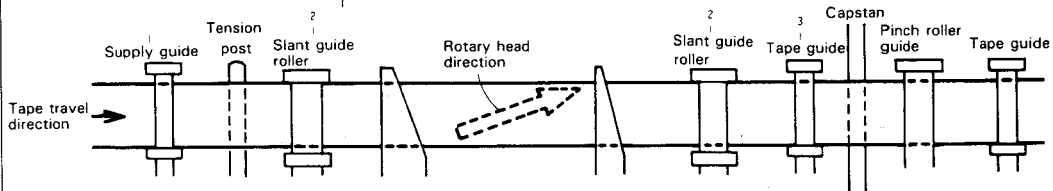
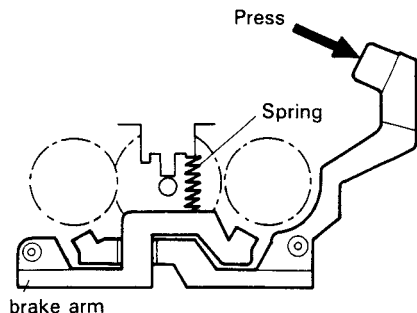
Jigs

DA300 gauge	4822 395 80391
Head current measuring jig	
Tape weight	

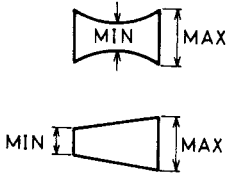
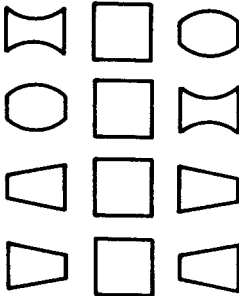
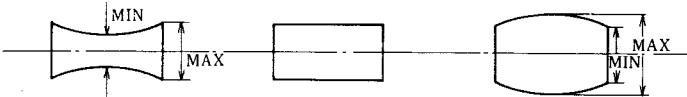
- After completing mechanical repairs, before assembling, make sure there are no short circuits before supplying power.
Before installing in the cassette housing, make sure the tape is heavy enough to press the detection switch.
- Perform envelope adjustment before installing the cassette housing then perform it again after installation.

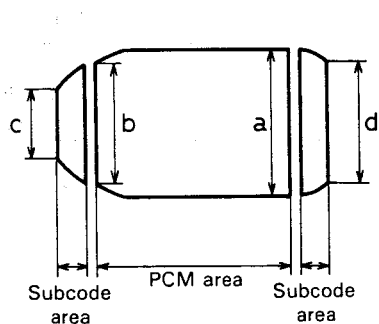
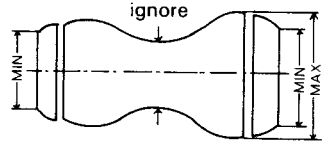
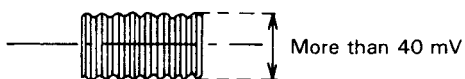
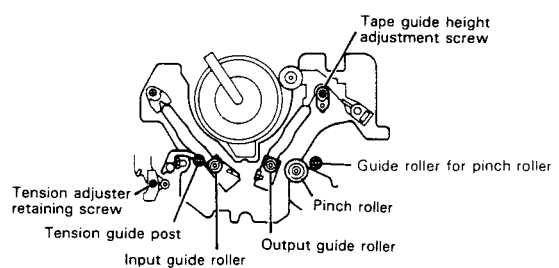
Mechanism adjustments

Items	Standards	Adjustment and checking methods
Take-up torque	PLAY 12 ~ 24 gf·cm FF/REW 60 ~ 150 gf·cm	Use a torque gauge to check this.
Back tension	7 ~ 12 gf·cm	Measure with a torque gauge in the play mode.
Pinch roller pressure	380±50 gf	<p>In the play mode, when the pinch roller shaft section is pulled in the direction of arrow using a tension gauge, the reading of tension gauge should be within the specifications when the pinch roller stops rotating.</p> 
Tension servo adjustment	6 ~ 9 g/cm	<p>If the back tension is within 6 ~ 9 gm-cm, secure the adjuster retaining screw.</p> <p>When the value is too low, move the tension adjuster to the left (to pull the spring). When the value is too high, move it to the right. (After adjustment, add the screw lock).</p>  <p>Stronger ← → Weaker</p>

Items	Standards	Adjustment and checking methods
Tape guide height adjustment	DA300 gauge	<p>Perform the following adjustments after removing the tape housing.</p> <ol style="list-style-type: none"> Adjust the supply guide so that the lower side of the supply guide come into contact with the gauge.  <ol style="list-style-type: none"> Check that the gauge pass through the slanted poles (supply and take-up poles). Adjust the pinch roller guide and take-up guide in the same way as in item 1 so that the lower side of the supply guide come into contact with the gauge.  <p>Procedure</p> <ol style="list-style-type: none"> ① Check that the lower side of the guide comes into contact with gauge DA300. ① Check that gauge DA300 passes through the posts. (It is acceptable if it passes through the upper sides of the posts.) ② Check the linearity (Electric Adjustment) and slant guide roller adjustments. ③ Visually check the pinch roller guide so that the lower side of the pinch roller guide comes into contact with the gauge. 
Checking the brake lever return operation		<p>When the brake lever is pressed slowly to the direction of arrow, check that the lever returns to its original position.</p>  <p>R brake arm</p>
Checking the tape transport		<p>Run the tape and check that the tape does not curl in the following positions.</p> <ol style="list-style-type: none"> Guide roller at entrance of supply tape guide. Guide roller at exit of take-up tape guide. Pinch roller guide Drum lead surface ... Adjust the guide roller height so that the tape travels along the lead surface.

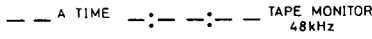
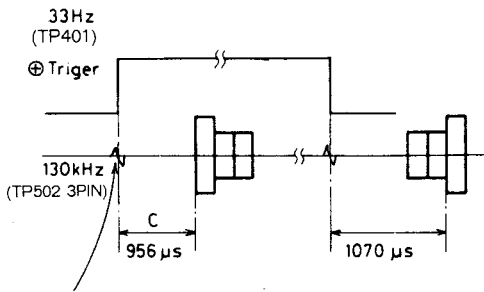
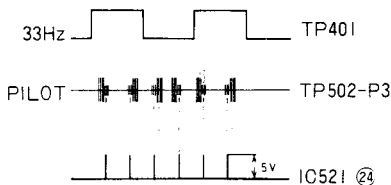
■ Electronic Adjustments


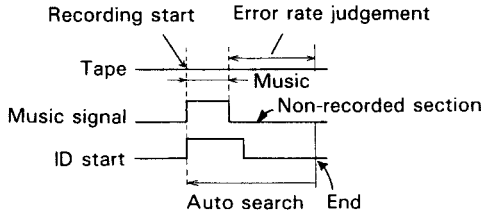
Items	Standards	Adjustment and checking methods										
Track linearity	<p>130 kHz leakage signal should be 70% (min) for the whole band.</p> <p>The peak-to-peak ratio of MAX and MIN should be 70% or more.</p> <p>Example</p> <div></div> $\frac{\text{MIN}}{\text{MAX}} = 70\% \text{ or more}$ <p>If possible, check with a personal computer (it should be within 2.5 micron). If a PC is not available, check with a scale.</p>	<p>Play MOT-12 and observe the 130 kHz leakage signal waveforms at TP502 (pin 3) using a digital oscilloscope and adjust the guide rollers on the supply and take-up sides so that the waveforms are flat.</p> <div><div>Output waveforms</div><div></div><div><div>Guide roller adjustment direction</div><table><tr><td>Supply side input</td><td>Take-up side output</td></tr><tr><td>↑</td><td>↑</td></tr><tr><td>↓</td><td>↓</td></tr><tr><td>↓</td><td>↑</td></tr><tr><td>↑</td><td>↓</td></tr></table></div></div> <ul style="list-style-type: none">• Next, visually check that the tape is positioned at the lower side of the pinch roller.• After performing the tape loading operation, when the waveforms are different, check and adjust again.<ol style="list-style-type: none">a) Lift up the pinch roller guide during play and tighten the screw if there is ourled tape and tighten the screw by one-quarter of a turn from where there is no curling.b) Tighten or loosen the take-up guide roller while looking from the side during play and when the tape reaches the upper end, loosen it by one-third of a turn.c) Recheck the above waveforms after the tape loading operation. (Rechecking is required when there is any variation in the waveforms.)d) The waveforms should not vary after search operation.	Supply side input	Take-up side output	↑	↑	↓	↓	↓	↑	↑	↓
Supply side input	Take-up side output											
↑	↑											
↓	↓											
↓	↑											
↑	↓											
Checking of leading edge waveforms	<p>MIN/MAX should be 50% or more within 1 sec after the start of tape playback.</p>	<p>Play MOT-12; when the cue to play, review to play, FF to play, REW to play, and STOP to play operations are performed, the output waveforms should be positive-going and 50% or more within 1 sec.</p> <div></div> $\frac{\text{MIN}}{\text{MAX}} \geq 50\%$										

Items	Standards	Adjustment and checking methods
Checking of rec/play envelope	PCM area 70% or more Subcode area 60% or more (Both channels)	<p>Perform non-signal recording and playback using FUJI tape (13 micron or 10 micron) and observe the waveform at TP603 (pin 8) using a digital oscilloscope. The output waveforms in both A ch and B ch PCM and subcode areas should be 70% and 60% or more respectively.</p>  $\frac{b}{a} \geq 70\% \text{ or more}$ $\frac{c}{a} \geq 60\% \text{ or more}$ $\frac{d}{a} \geq 60\% \text{ or more}$ <p>(This is one example of the waveform.)</p>
Checking of search envelope It is possible to alternate between the rec/play envelopes	MOT-3 M or equivalent $\frac{\text{MIN}}{\text{MAX}} = 50\% \text{ or more}$	<p>Perform the search play using MOT-3 tape; the MIN/MAX ratio of output waveforms at CNA03 (pin 2) should be 50% or more in the following cases.</p>  <ol style="list-style-type: none"> 1. ATF should be on-track during CUE/REVIEW. 2. Envelope waveform should be 50% or more during FF/REW search.
Absolute level	P-P level should be more than 40 mV in both A and B channels.	<p>P-P level should be more than 40 mV when MOT-1 is running.</p> 
Locking paint		<p>When the adjustments are completed, apply locking paint to the specified positions including supply guide, pinch roller guide, take-up guide, tension adjuster retaining screw.</p> 

Items	Standards	Adjustment and checking methods
Checking cassette holder operation		1.Cassette insertion and removal operations should be smooth. 2.The overstroke of each switch should be more than 0.5 mm including cassette detection switch, loading start switch and cassette control switch. 3.There should be no abnormal sound during cassette insertion and removal. 4.The cassette should not float after being loaded.
Checking of tape end detection		Auto-stop operation should be performed positively at the tape end during FF/REW operation. (However, the tape should not be ejected.)
Rechecking track linearity		After the tape is installed in the cassette housing, check that the track linearity waveform is within the standard range using MOT-12.

6 Final Adjustments

Items	Standards	Adjustment and checking methods
Checking power ON		<p>When the power is set to ON, check that the FL indicator lights.</p> <p style="text-align: center;">  </p> <p style="text-align: center;">↓ When the tape is not loaded</p> <p style="text-align: center;">no TAPE</p> <ul style="list-style-type: none"> When the power is set to ON with the cassette door OPEN, the CLOSE operation is performed. When the power is set to ON, the drum motor rotates momentarily. When the cassette door is closed after the tape has been wound to the leader tape at the tape end, tape end detection should be performed and the cassette should be ejected. When a tape with no accidental erasure prevention tab is inserted, the record-pause mode should not be engaged. SAMPLING MONITOR should be performed in the recording mode.
VCO oscillator		<p>Analog standard mode</p> <p>Connect the digital tester to the point where R501 is connected to R502 on the LSI PCB and adjust L501 so that the level is 2.0 ± 0.2 V.</p> <p>At this time, the waveform at the point where TPR501 and R502 are connected should be DC.</p>
Drum phase adjustment	C : $956 \mu\text{s} \pm 50 \mu\text{s}$	<p>Connect the digital oscilloscope and play the standard tape MOT-3 and adjust VR521 so that the phase difference between TP502 pin 3 output (130 kHz) and TP401 (bus wire) output is $956 \mu\text{s} \pm 50 \mu\text{s}$.</p> <p>(Perform this adjust with Auto EDIT button ON with a shortcircuit between pins 1 and 3 of TP501.)</p> <p style="text-align: center;">  </p> <p>Check that the head switching noise is generated in accordance with positive-going of the trigger signal (Deviation tolerance $\pm 10 \mu\text{s}$).</p>
Checking SH		<p>Play MOT-3 and check the waveforms.</p> <p style="text-align: center;">  </p>
Capstan speed check (play)	633.3 ± 3 Hz	<p>Play MOT-3 and check that the CFG frequency at TP503 is in the specified range.</p>

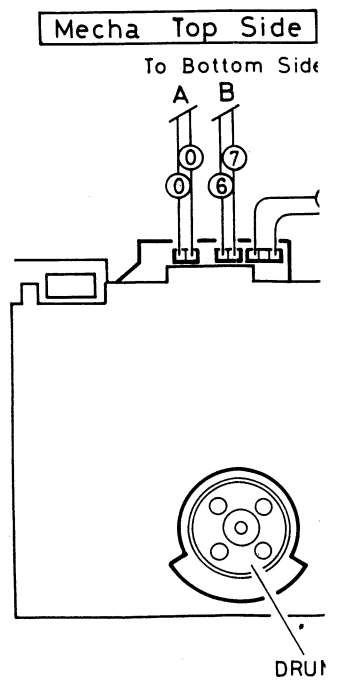
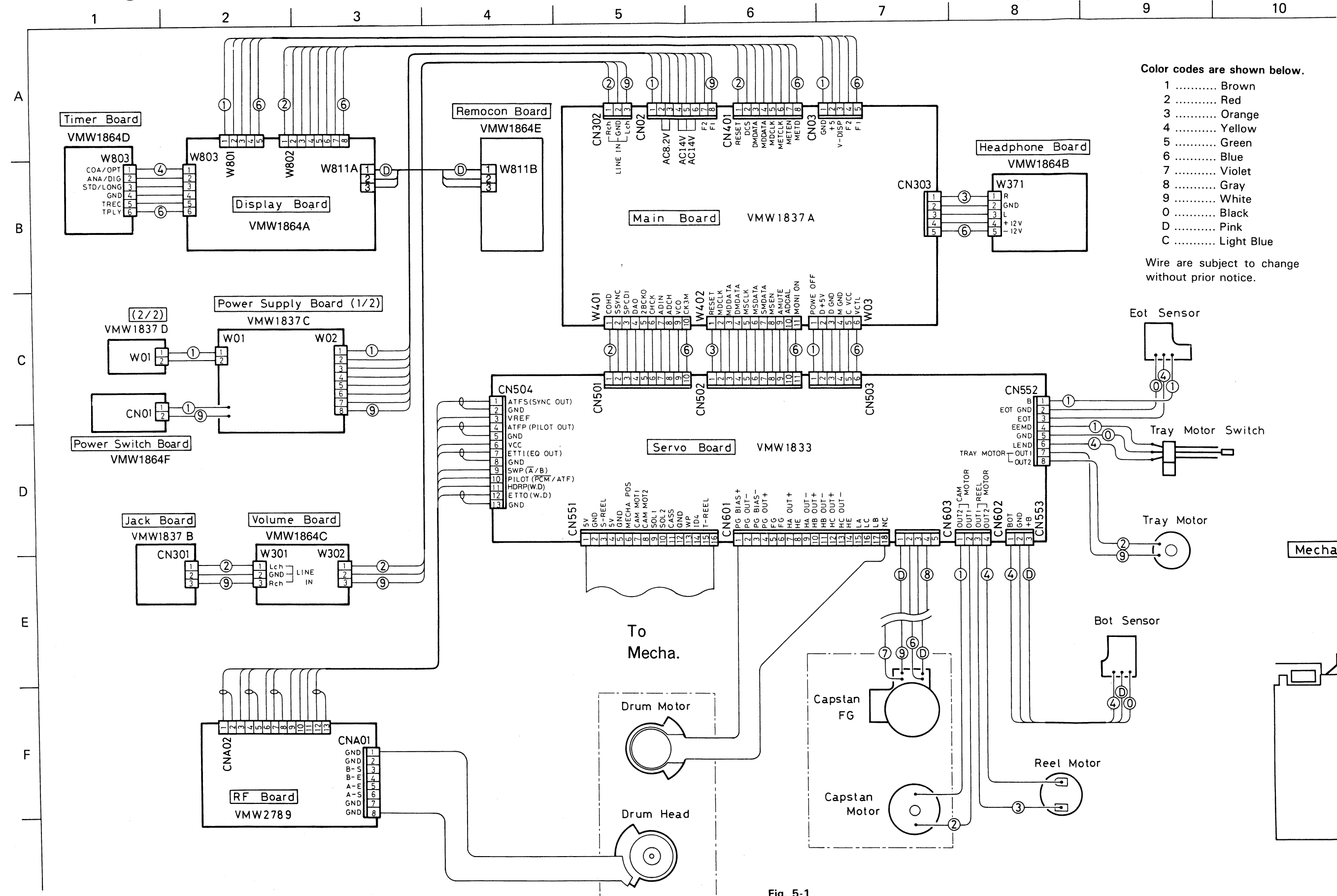
Items	Standards	Adjustment and checking methods
Checking capstan phase (REC)	Variation ratio Less than 30%	<p>Set to the record mode and check that the ④ CPO waveform at IC521 on the servo P.C.B. is as follows. (Don't flow duty of PWM)</p>  <p>TIME 5 μs VOLT 0.2 V Trigger "+"</p>
Checking rec/play error rate	Less than 60 Hz	<ol style="list-style-type: none"> 1. Shortcircuit between pins 1 and 2 of TP501 on the LSI PCB and press the display switch to set to the error rate display mode. Then, play MOT-3 and check that the error rate is within 60 Hz. 2. Mark the START ID with music or overwrite recording and set the input volume to min. After recording a 10 sec no-sound section and performing auto search, check that the rec/play error rate is less than 60 Hz in the no-sound section.  <p>Rec/Play DA-46 (or DA-120) and check that the error rate is less than 60 Hz and then remove the shortcircuit.</p>

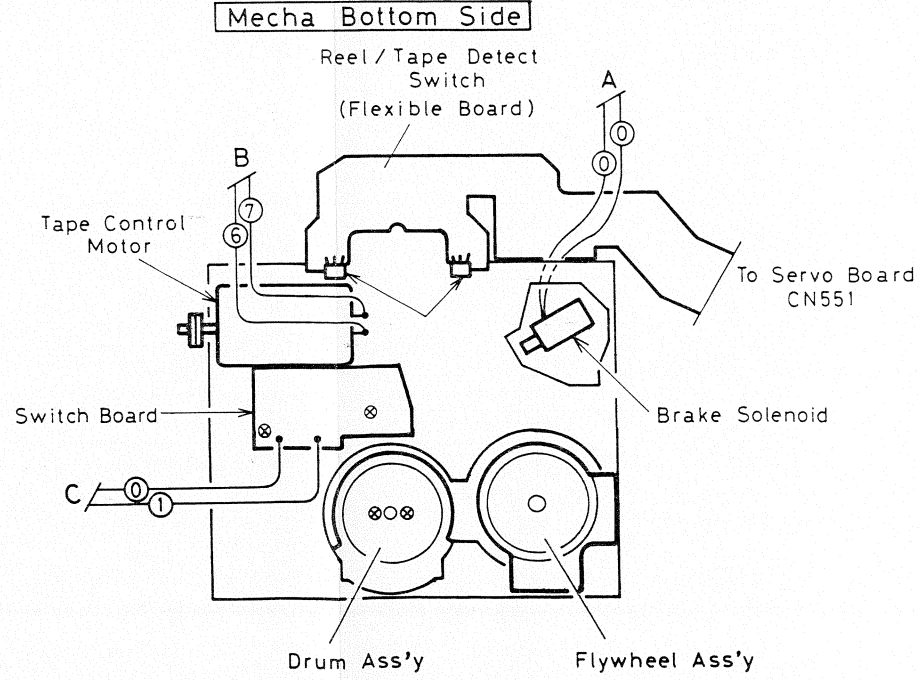
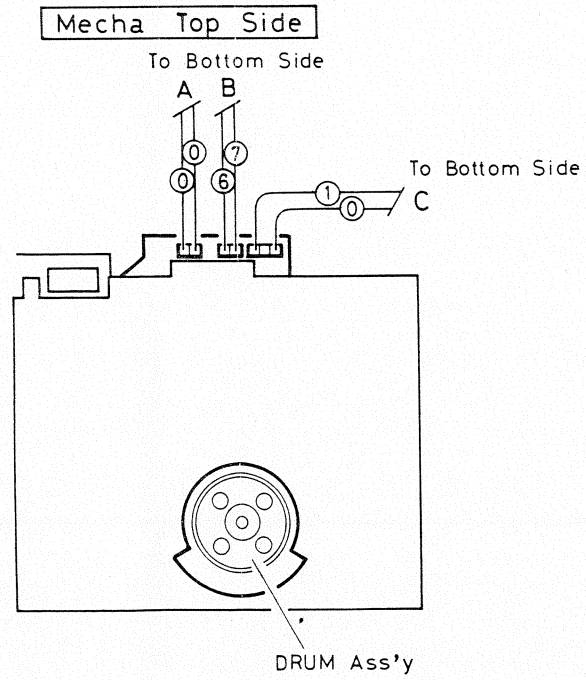
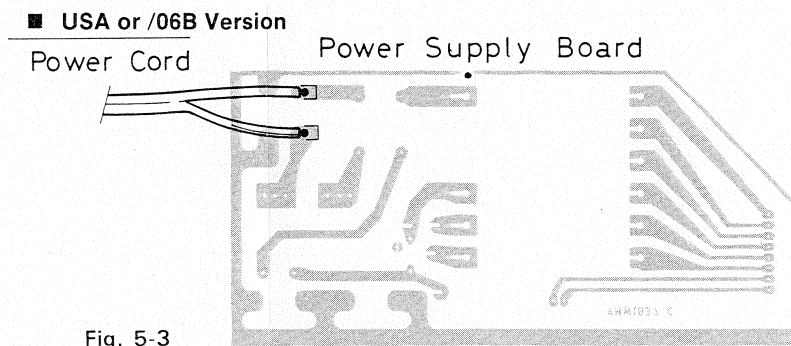
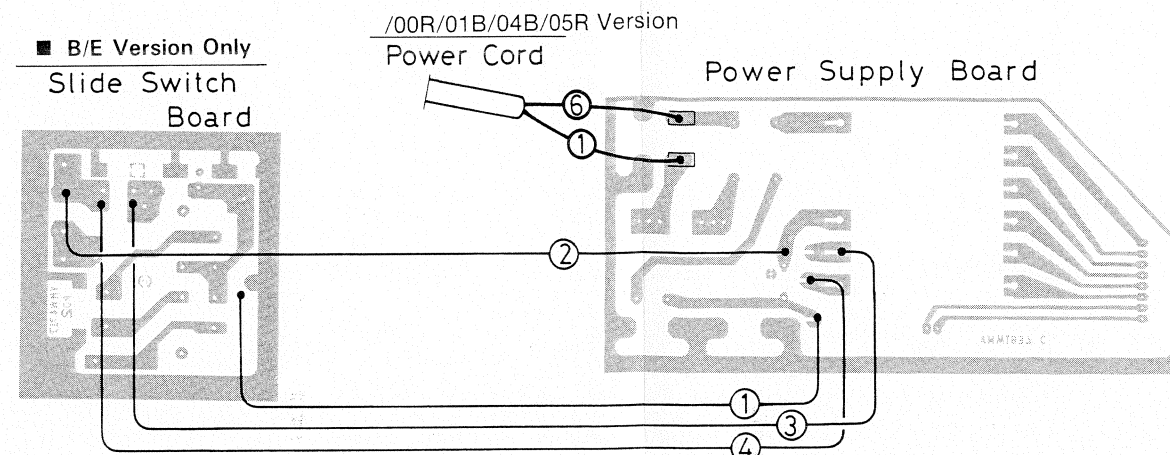
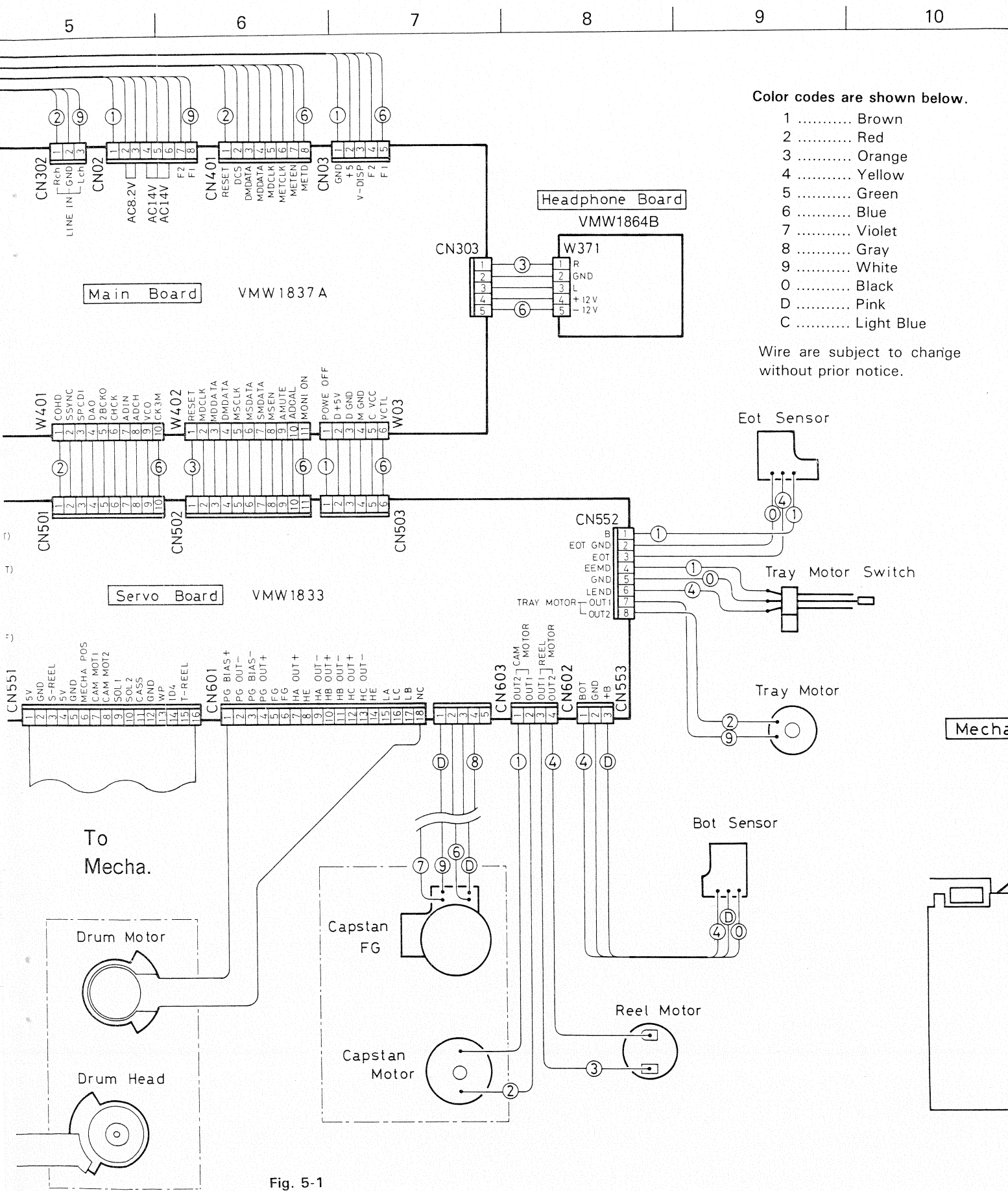
■ Checking after Adjustment

Items	Standards	Adjustment and checking methods																					
Checking of DA response (PLAY) With audio-analyzer VP-7712A (for example) LPF→22 kHz ON (or 30 kHz is also applicable) MEASUREMENT LEVEL ON	OUT 6.2 dBv±2 dB	Play the specified tape and check the following. When specified, set to the normal or long play mode. MOT-14...1 kHz 0 MARGIN L-R ch is 10 sec change. • Checking of MOT-14 playback level The LINE output level should be in the range of 6.2 dBv±2 dB and the difference between the L and R channels should be within 1 dB with both normal (48 Hz) and long play (32 kHz) sampling frequencies.																					
Checking of distortion	Less than 0.01% (Normal play mode) Less than 0.1% (Long play mode)	Play MOT-14; the distortion should be less than 0.01% when playing back in the normal (48 kHz) mode. Play MOT-23; the distortion should be less than 0.1% when playing back in the long play (32 kHz) mode.																					
Checking separation	More than 80 dB	Play the 4th and 5th tracks of tape RMT1007 and check the output level of the R ch while playing the L ch and vice versa; the level difference between the R and L channels should be more than 80 dB for both measurements.																					
Checking playback frequency response (LPF unnecessary)	20 Hz : 0±1 dB 10 kHz : 0±1 dB 22 kHz : 0±1 dB	Play MOT-6 (20 Hz, 10 kHz); the frequency response should be 0±1 dB with respect to 1 kHz and the same as 22 kHz.																					
Checking emphasis (LPF unnecessary)	5 kHz : -4.53±1 dB 16 kHz : -9.04±1 dB	Play the 9th and 10th tracks of tape RMT1007; when playing back the 5 kHz and 16 kHz signals, the emphasis should be in the range of -4.53±1 dB and -9.04±1 dB respectively.																					
Checking headphone output level	-12.5 dBv±3 dB/8 Ω	Play MOT-14; the headphone output should be in the range of -12.5±3 dB.																					
S/N ratio (Additionally use a JIS A curve filter at LP 22 kHz)	More than 90 dB	The S/N ratio should be more than 90 dB when playing MOT-14 and tapes on which no signal is recorded.																					
(Rec/Play) Minimum input level	-24 dBv±2 dB	Use the MOT-0 rec/play tape and perform the following measurement. Set the input volume to max. and apply 1 kHz signal from LINE IN; when the full scale is set to -18 dB, the level should be in the range of -24 dBv±2 dB.																					
Rec/Play sensitivity	In both normal and long play modes, 6.2±2 dBs	When recording or playing back the 1 kHz full scale signal, the LINE OUT level should be in the range of 6.2 dBv±2 dB. Normal play: 6.2 dBv±2 dB Long play : 6.2 dBv±2 dB																					
Distortion	Less than 0.01%	Distortion should be less than 0.01% when recording the 1-kHz signal at the maximum recording level of 1 kHz.																					
Rec/Play frequency response (LPF unnecessary)	Normal play mode 10 Hz : 0±1 dB 100 Hz : 0±1 dB 10 kHz : 0±1 dB 22 kHz : -0.2±1 dB Long play mode 10 kHz : 0±1 dB 14.5 kHz : 0±1 dB 16 kHz : -5 dB less than	Apply the specified input level from LINE IN and record 1 kHz, 10 Hz, 100 Hz, 10 kHz, 22 kHz signals in sequence; the level difference of LINE OUT should be within the following ranges with respect to 1 kHz. (Measure using 14.5 kHz and 16 kHz signals in the long play mode.) <table> <tr> <td></td><td>Normal play</td><td>Long play</td></tr> <tr> <td>10 Hz</td><td>0±1 dB</td><td>0±1 dB</td></tr> <tr> <td>100 Hz</td><td>0±1 dB</td><td>0±1 dB</td></tr> <tr> <td>10 kHz</td><td>0±1 dB</td><td>0±1 dB</td></tr> <tr> <td>14.5 kHz</td><td>—</td><td>0±1 dB</td></tr> <tr> <td>16 kHz</td><td>—</td><td>-5 dB less than</td></tr> <tr> <td>22 kHz</td><td>-0.2±1 dB</td><td>—</td></tr> </table>		Normal play	Long play	10 Hz	0±1 dB	0±1 dB	100 Hz	0±1 dB	0±1 dB	10 kHz	0±1 dB	0±1 dB	14.5 kHz	—	0±1 dB	16 kHz	—	-5 dB less than	22 kHz	-0.2±1 dB	—
	Normal play	Long play																					
10 Hz	0±1 dB	0±1 dB																					
100 Hz	0±1 dB	0±1 dB																					
10 kHz	0±1 dB	0±1 dB																					
14.5 kHz	—	0±1 dB																					
16 kHz	—	-5 dB less than																					
22 kHz	-0.2±1 dB	—																					

Items	Standards	Adjustment and checking methods
Crosstalk	More than 75 dB (use the 600 Ω attenuator)	Apply a 1 kHz signal at the maximum input level to one channel and record "no signal" on the other channel; when playing the recorded sections, measure the ratio between the output levels of the signal leaking into the no signal channel and the 1 kHz playback channel. The value should be more than 75 dB.
Rec/Play S/N ratio (Additionally use a JIS A curve filter at LPF 22 kHz.)	More than 82 dB	Record a 1 kHz signal at the maximum recording level, leaving "no signal" sections; when played, the level difference between the two sections should be more than 82 dB.
Checking of start ID detection level	- 40 dB \pm 3 dB	Set to the recording mode with the input volume set to max. and adjust to a recording level of 0 dB using ATT. Next, turn to about 60 dB down from 0 dB using the ATT control. Then increase the input level gradually with the ATT control and check the level at which S-ID lights. Check that the difference in the ATT value between 0 dB recording and S-ID lighting is - 40 dB \pm 3 dB.

7 Wiring Connections





8 Block Diagram

■ System Block Diagram

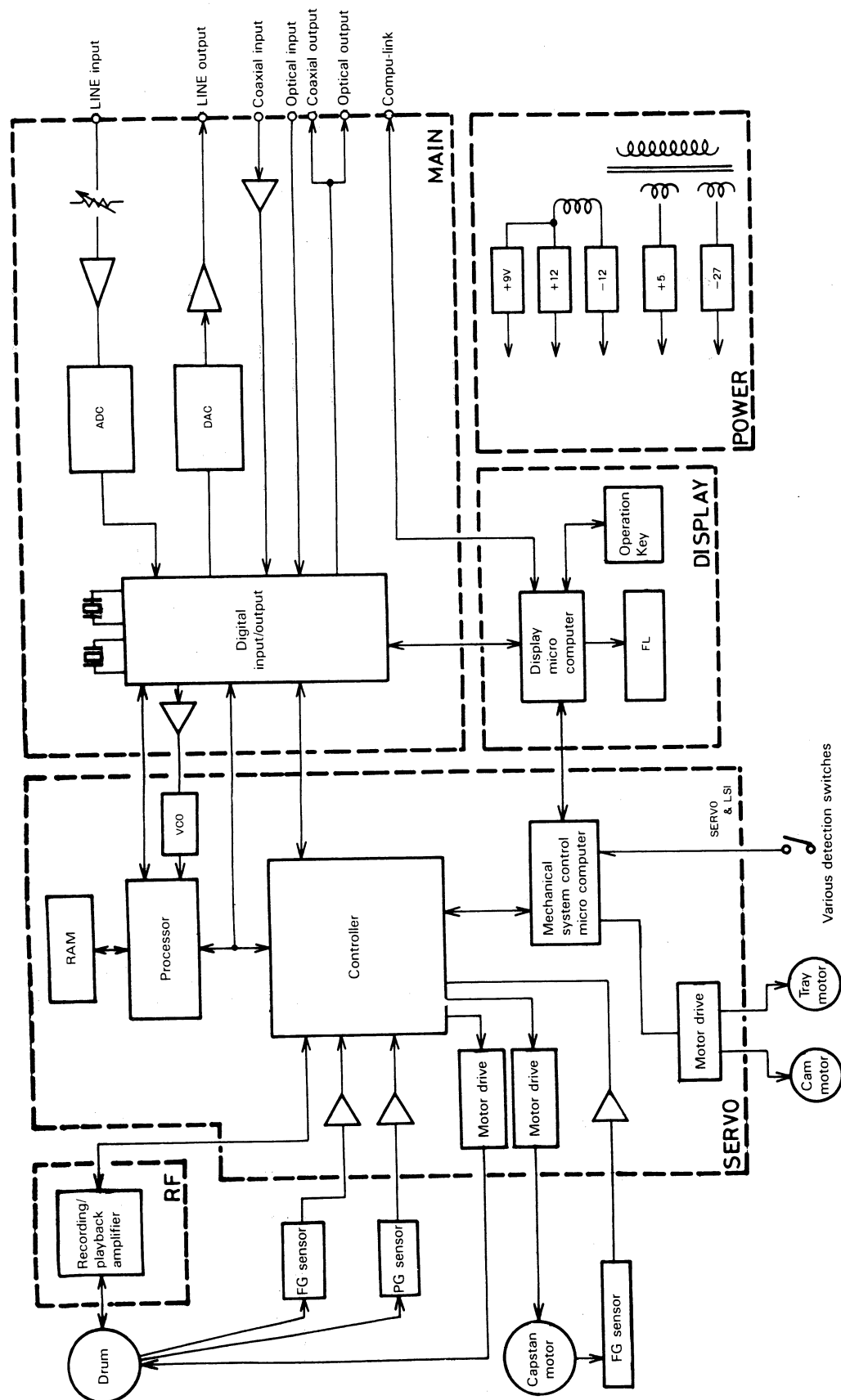


Fig. 6-1

■ Circuit Diagram

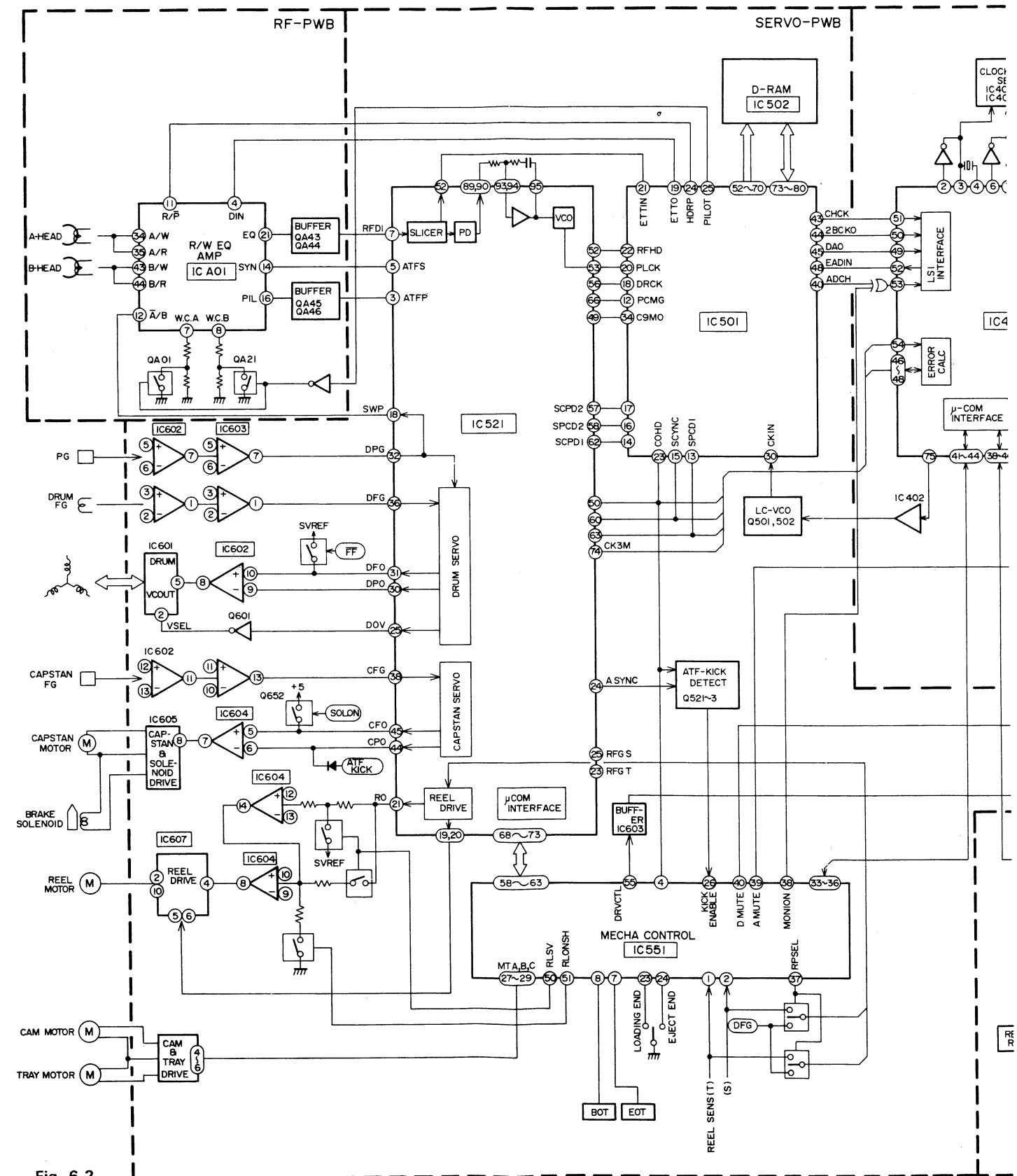


Fig. 6-2

■ Circuit Diagram

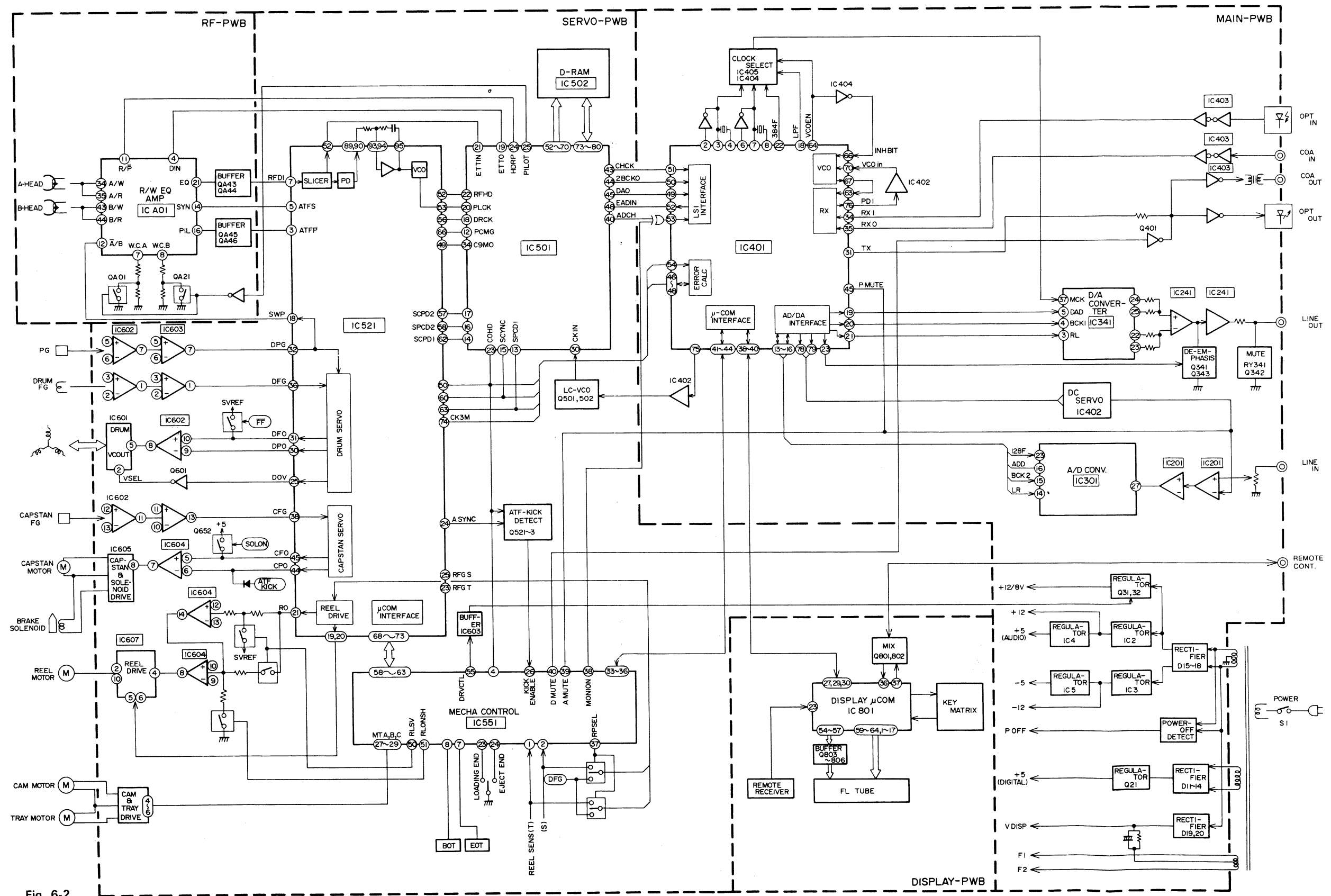


Fig. 6-2

9 Standard Schematic Diagram and Location of P.C. Board Parts

1 2 3 4 5 6 7 8 9 10

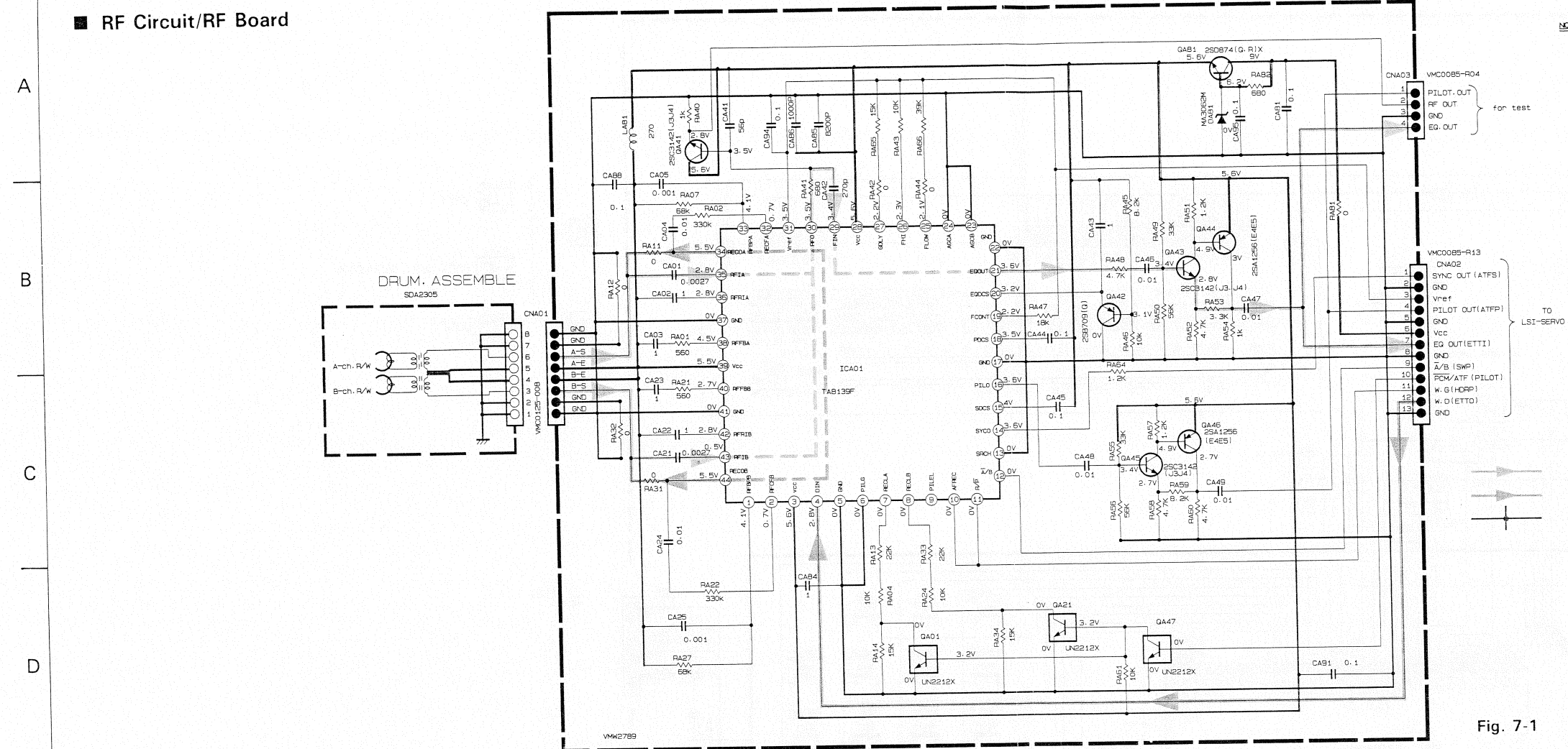


Fig. 7-1

(Top side)

(Bottom side)

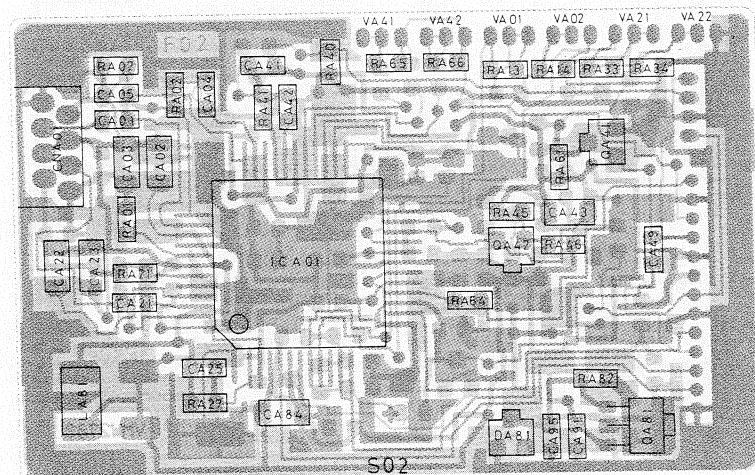


Fig. 7-2

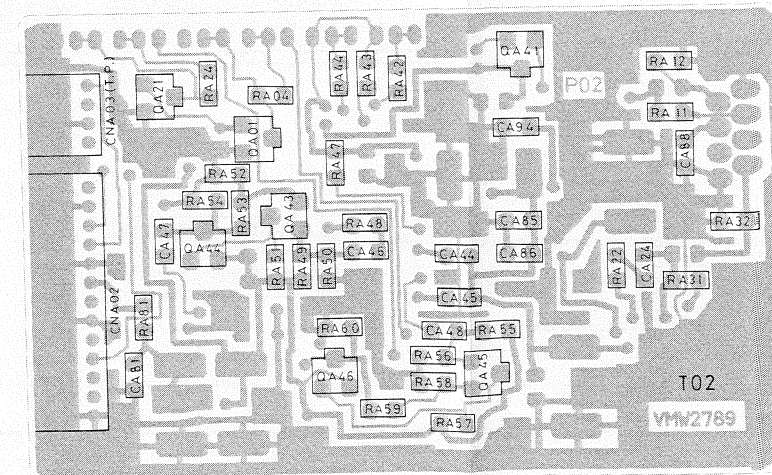
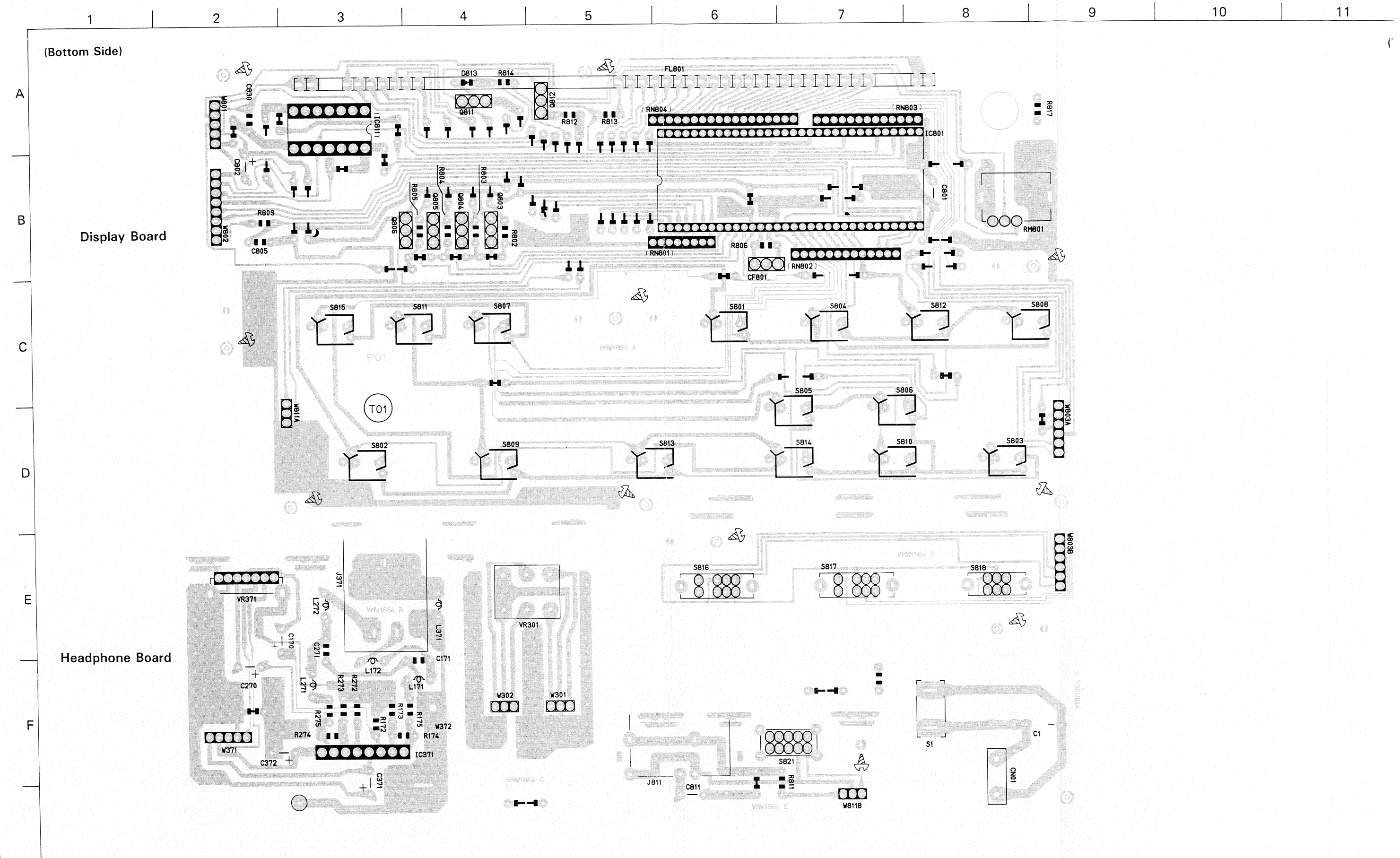


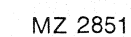
Fig. 7-3

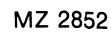
□ Chip parts

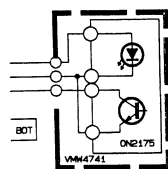
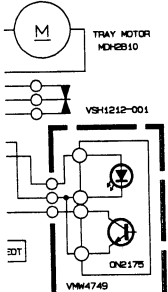
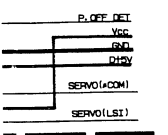
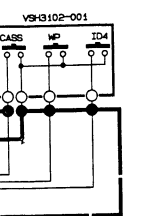
□ Chip parts

■ Display Board (Display/Headphone/Power Switch/Volume/Timer Board)





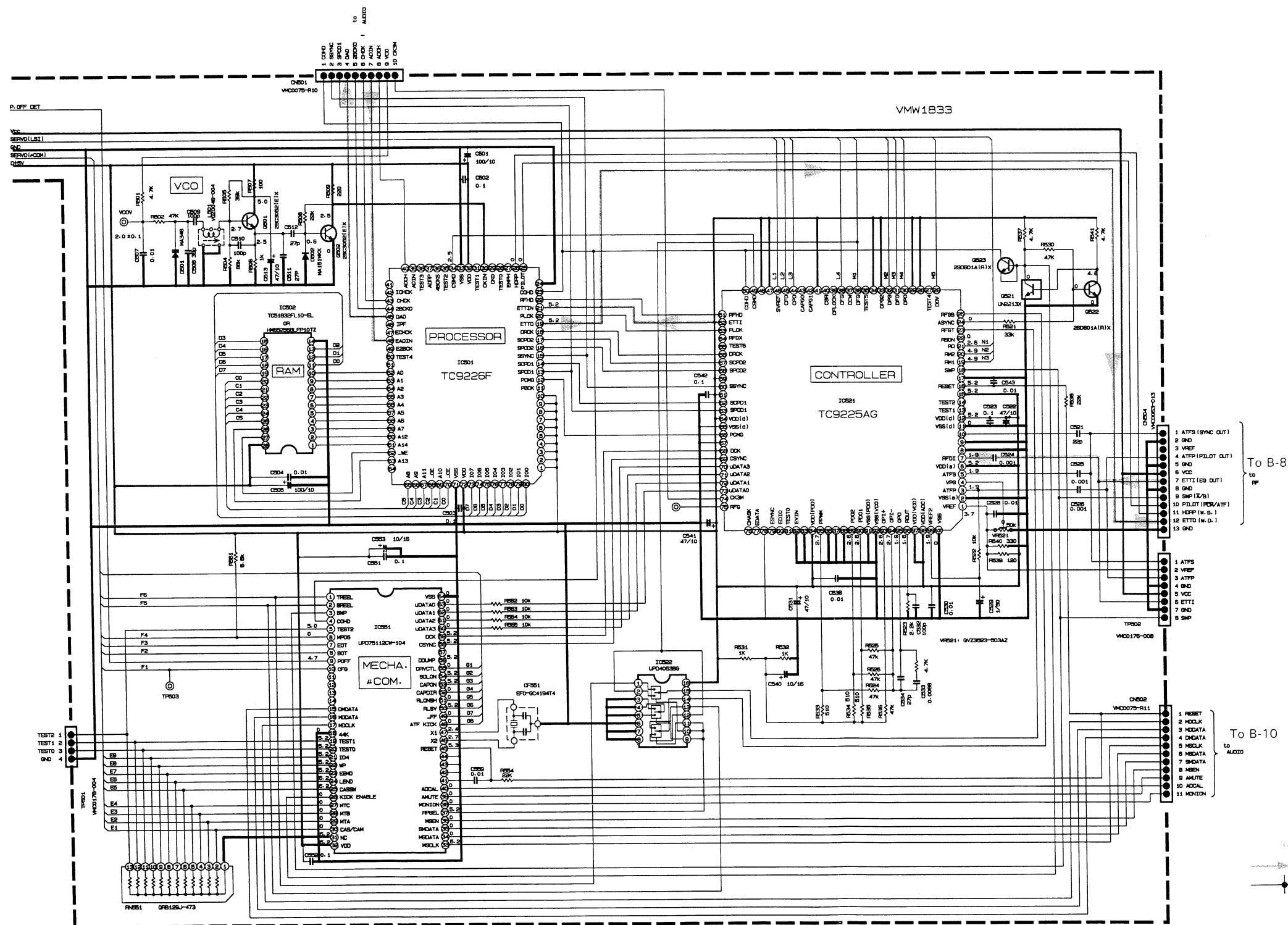
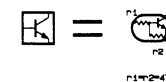




To F-2

To A-10

NOTES:
 WHEN TEST0 IS SHORTED TO GND, IT IS AVAILABLE TO SHOW BER(BLOCK ERROR RATE) ON DISPLAY.
 WHEN TEST1 IS SHORTED TO GND, CONTROL SYSTEM IS SET IN MECHANISM ADJUSTMENT MODE.
 IF "10 EDIT" BUTTON IS PRESSED IN THIS MODE, CLAM PHASE ADJUSTMENT CAN BE ENABLED.
 TEST2 IS USED FOR AUTOMATIC MEASURING SYSTEM.
 UNLESS OTHERWISE SPECIFIED:
 ALL RESISTORS ARE 1/10W 4.5% METAL GLAZE RESISTORS, AND RESISTANCE VALUES ARE IN OHM(S).
 ALL CAPACITORS ARE 50V (ORWARD-BOV TP) OR ELECTROLYTIC CAPACITORS, AND CAPACITANCE VALUES ARE IN μ F(OR μ F).
 E. CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE(F)/RATED VOLTAGE(V).
 VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER.
 VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER IN STOP MODE, WITH THE INPUT SELECT SWITCH AT ANALOG POSITION.



Blue line shows the signal at playback.
 Red line shows the signal at recording.
 + B Line.

A

B

C

□

100

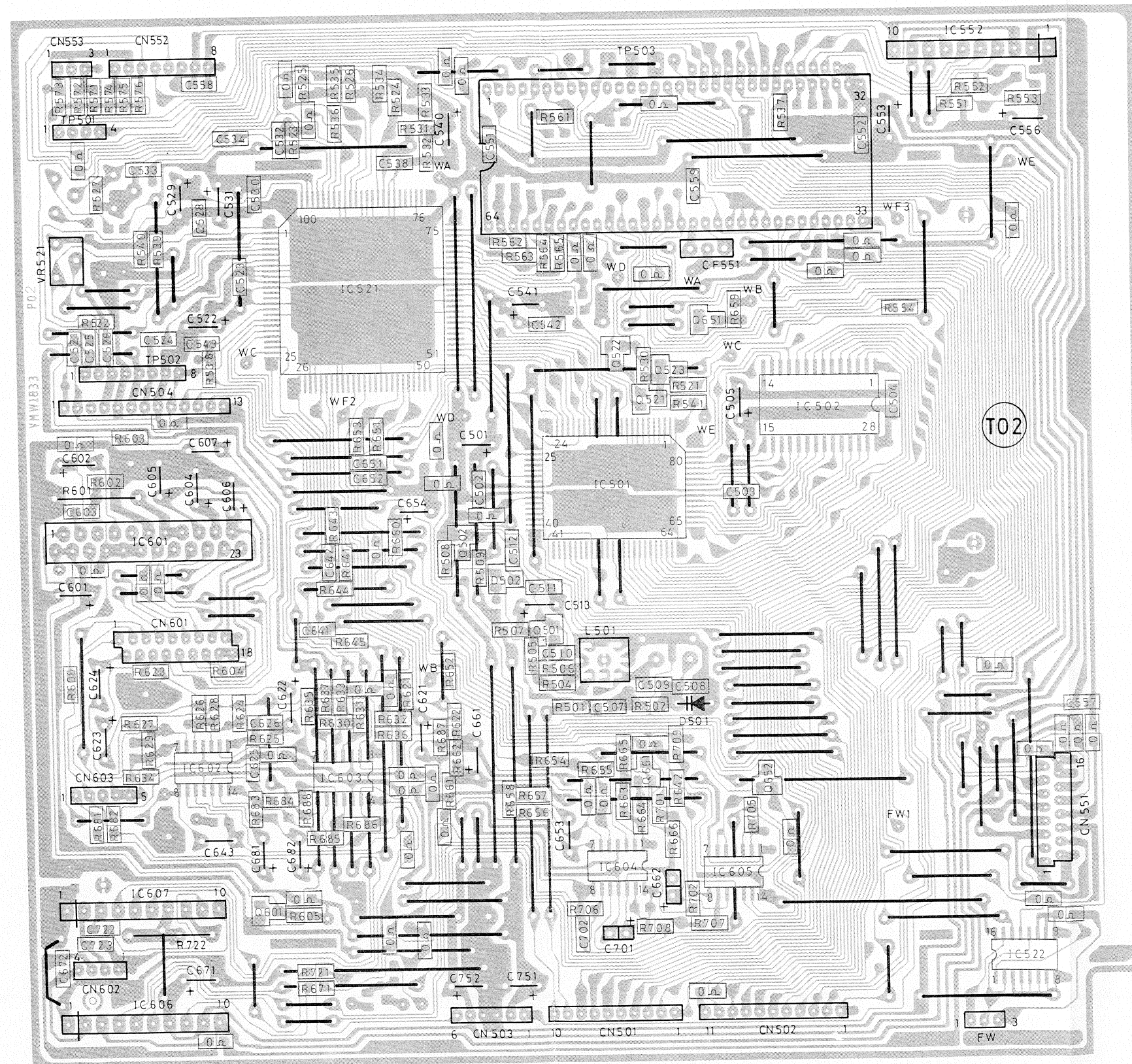


Fig. 7-8

■ Audio Circuit

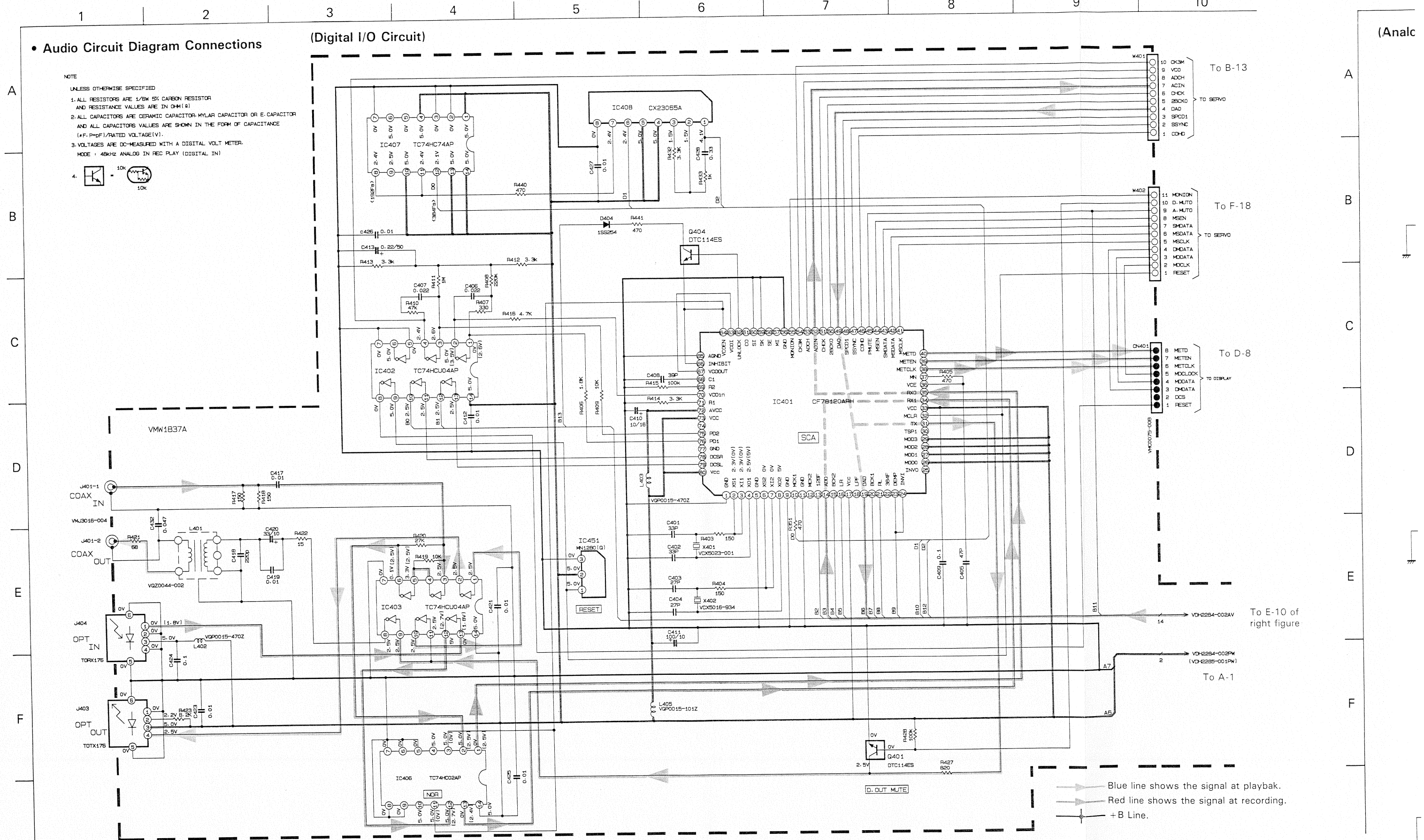




Fig. 7-12

UNLESS OTHERWISE SPECIFIED

1. ALL RESISTORS ARE 1/8W 5% CARBON RESISTOR AND RESISTANCE VALUES ARE IN OHM (R)
2. ALL CAPACITORS ARE CERAMIC CAPACITOR, MYLAR CAPACITOR OR E. CAPACITOR AND ALL CAPACITORS VALUES ARE SHOWN IN THE FORM OF CAPACITANCE (uF, pF) / RATED VOLTAGE (V).
3. VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER.
MODE = 40KHZ ANALOG IN REC PLAY (DIGITAL IN)
4.  

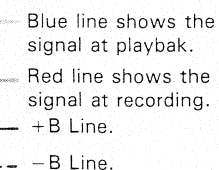
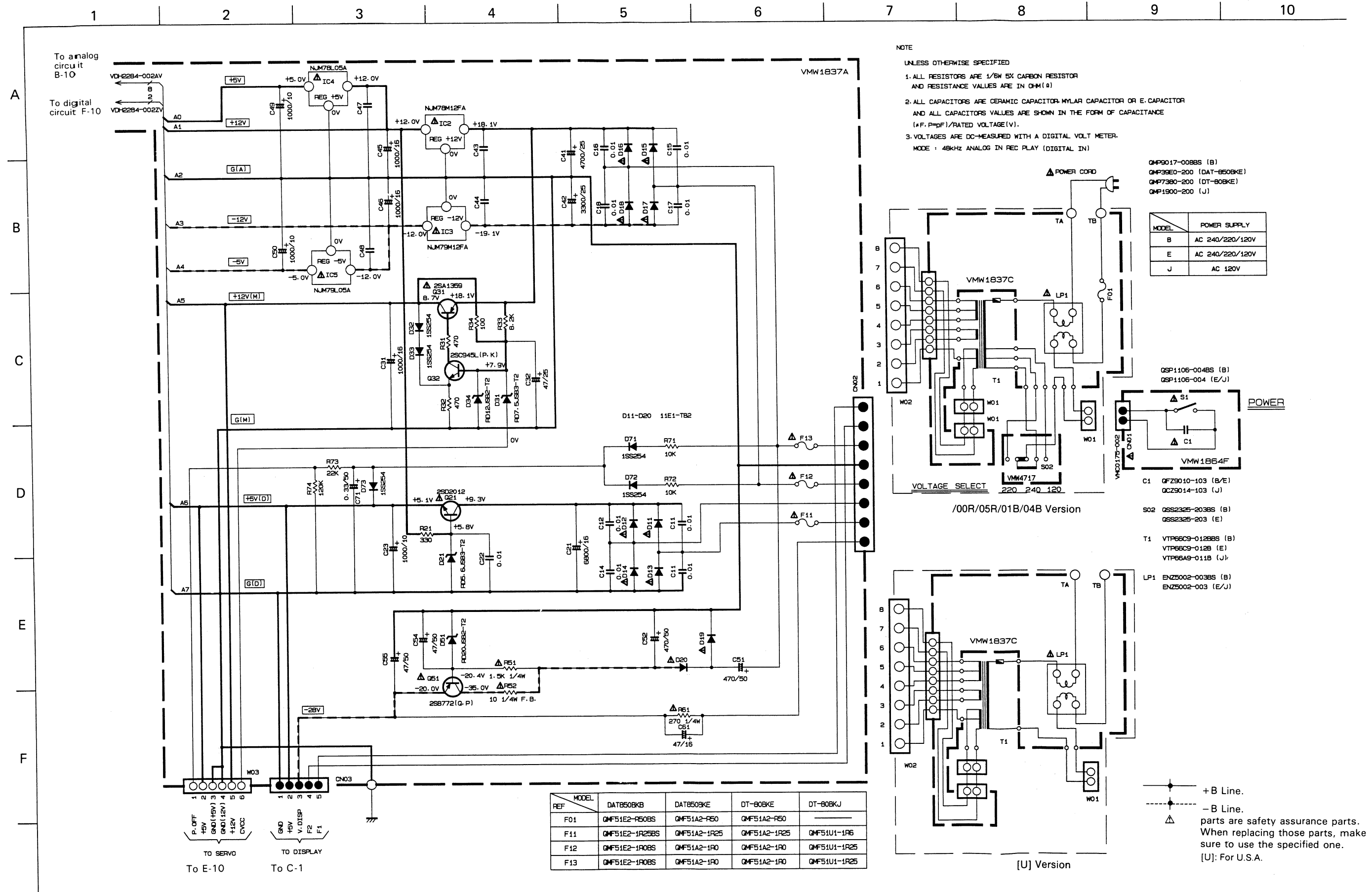


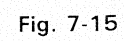
Fig. 7-13

■ Power Supply Circuit



1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

A
B
C
D
E



MZ 2856

(Top side)

A

B

C

D

E

F

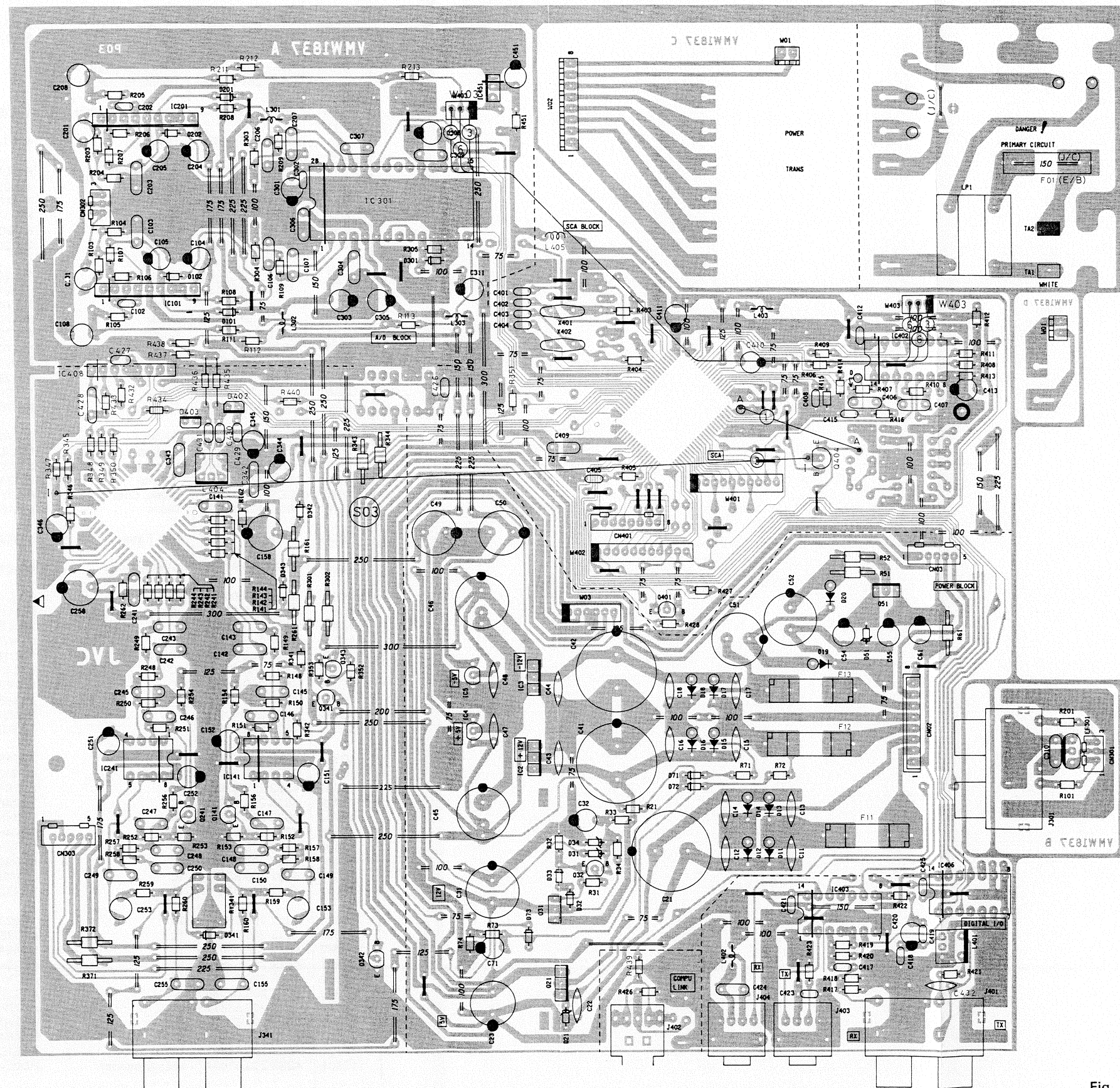


Fig. 7-17

10 P.C. Board Parts List

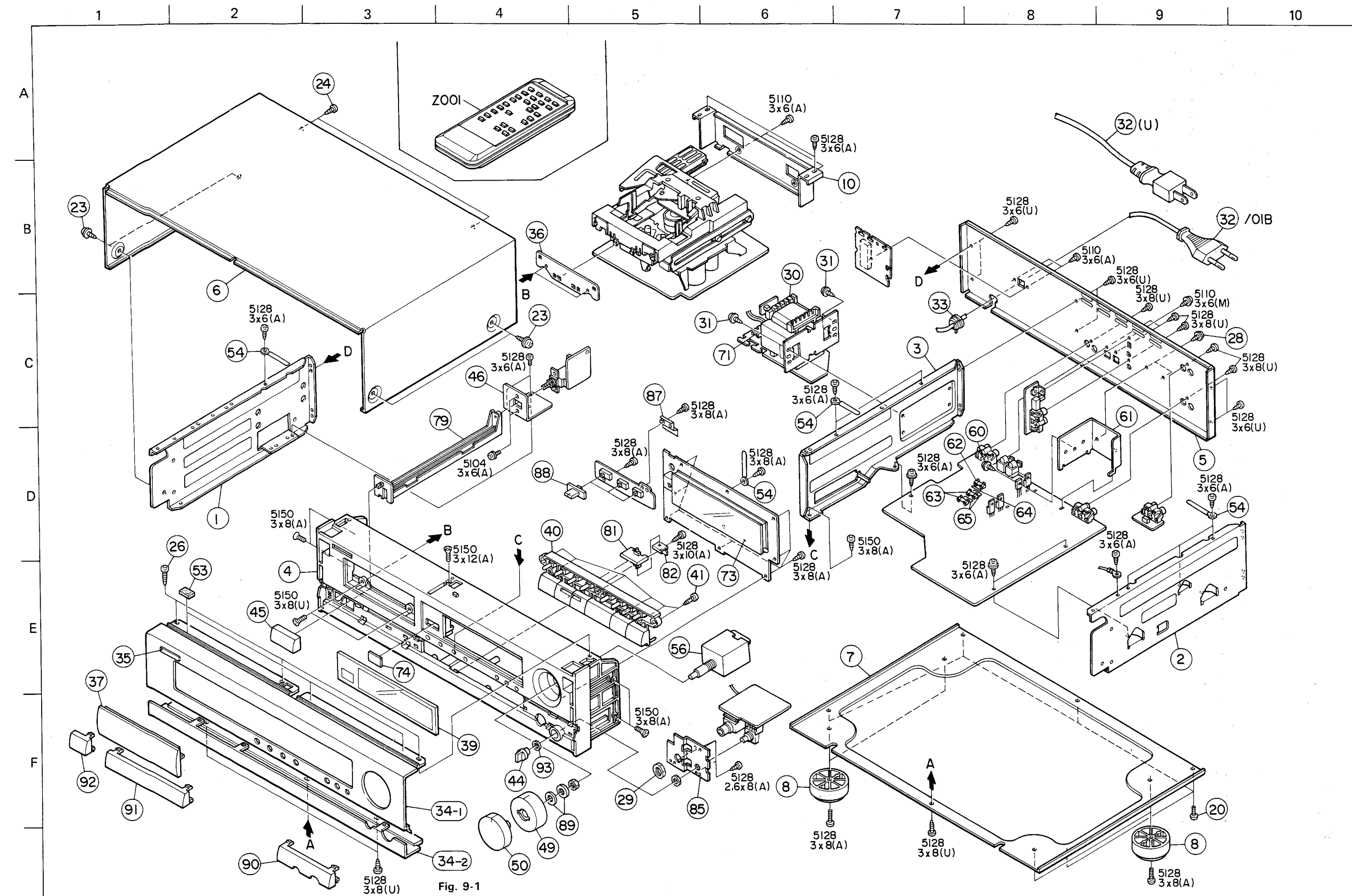
▲ Parts are safety assurance parts.
When replacing those parts, make
sure to use the specified one.

REF. DESIG.	PART NO.	DESCRIPTION		REMARKS
CF551	4822 242 73957	Resonator	EFO-GC4194T4	
CF801	4822 242 73956	Resonator	EFO-GC4004T4	
CN551	4822 267 31312	Connector, 16P		
CN601	4822 267 31313	Connector, 18P		
CNA01	4822 267 31309	Connector, 8P		
DA81	4822 130 32873	Zener Diode, Chip	MA3062(M)TX	
▲ D11				
}	4822 130 80635	Diode	11E1-TB2	
▲ D20				
D31	4822 130 80272	Zener Diode	RD7.5JSAB3-T2	
D32	4822 130 82494	Diode	1SS254T-77	
D33	4822 130 82494	Diode	1SS254T-77	
D34	4822 130 80091	Zener Diode	RD12JSAB2-T2	
D51	4822 130 82474	Zener Diode	RD20JSAB2-T2	
D71	4822 130 82494	Diode	1SS254T-77	
D72	4822 130 82494	Diode	1SS254T-77	
D73	4822 130 82494	Diode	1SS254T-77	
D101	4822 130 81717	Diode	MA700A-TA	
D102	4822 130 81717	Diode	MA700A-TA	
D201	4822 130 81717	Diode	MA700A-TA	
D202	4822 130 81717	Diode	MA700A-TA	
D203	4822 130 33948	Zener Diode	RD5.6JSAB3-T2	
D301	4822 130 82494	Diode	1SS254T-77	
D341	4822 130 82494	Diode	1SS254T-77	
D342	4822 130 81717	Diode	MA700A-TA	
D343	4822 130 81717	Diode	MA700A-TA	
D402	4822 130 82495	Varicap	SVC321(C, D)SP	
D403	4822 130 82495	Varicap	SVC321(C, D)SP	
D501	4822 130 82492	Varicap	MA346	
D502	4822 130 43408	Diode, Chip	MA151WKX	
D813	4822 130 32362	Diode	MA165-TA5V	
EF31	4822 242 73955	EMI Filter	VCR0012-101Z	
FL801	4822 130 90956	Display Unit	BG-614GK	
▲ IC2	4822 209 60826	IC	NJM78M12FA	
▲ IC3	4822 209 63641	IC	NJM79M12FA	
▲ IC4	4822 209 70082	IC	NJM78L05A-T	
▲ IC5	4822 209 83825	IC	NJM79L05A-T	
ICA01	4822 209 63671	IC, Chip	TA8139F	
IC101	4822 209 63678	IC	μPC4570HA	
IC141	4822 209 63639	IC	NJM5532D	
IC201	4822 209 63678	IC	μPC4570HA	
IC241	4822 209 63639	IC	NJM5532D	
IC301	4822 209 63669	IC	AK5326-VP	
IC341	4822 209 63681	IC	JCE4302A	
IC371	4822 209 63672	IC	M5218AL	
IC401	4822 209 63682	IC	CF78120APH1/O	
IC402	4822 209 72323	IC	TC74HCU04AP	
IC403	4822 209 72323	IC	TC74HCU04AP	
IC406	4822 209 61688	IC	TC74HC02AP	
IC407	4822 209 72333	IC	TC74HC74AP	
IC408	4822 209 63683	IC	CX23065A	
IC451	4822 209 83414	IC	MN1280(Q)	
IC501	4822 209 63673	IC	TC9926F	
IC521	4822 209 63674	IC	TC9225AG	
IC551	4822 209 63685	IC	μPD75112CW-104	
IC552	4822 209 63675	IC	M54649L	
IC601	4822 209 63676	IC	HA13403V	
IC602	4822 209 63677	IC	μPC324G2-T1	
IC603	4822 209 63686	IC	μPC339G2-T1	
IC604	4822 209 63677	IC	μPC324G2-T1	
IC605	4822 209 63642	IC	μPD4066BG-T1	
IC606	4822 209 63675	IC	M54649L	
IC607	4822 209 82059	IC	BA6109	
IC801	4822 209 63684	Microprocessor	HD614023SA79	

REF. DESIG.	PART NO.	DESCRIPTION	REMARKS
J301	4822 267 31317	Terminal, RCA	Line In
J341	4822 267 31317	Terminal, RCA	Line Out
J371	4822 267 31311	Jack, Headphone	
J401	4822 267 31318	Terminal, RCA	Coaxial
J403	4822 267 31314	Jack, Optical Out	
J404	4822 267 31315	Jack, Optical In	
J811	4822 267 31316	Terminal, RCA	
LA81	4822 157 63037	Choke Coil, Chip	
LP1	4822 242 73954	EMI Filter	
L171	4822 157 63035	Choke Coil, 0.1μH	
L271	4822 157 63035	Choke Coil, 0.1μH	
L301	4822 157 63036	Choke Coil	
L302	4822 157 63036	Choke Coil	
L303	4822 157 63036	Choke Coil	
L401	4822 148 81144	Pulse Transformer	
L402	4822 157 63036	Choke Coil	
L403	4822 157 63036	Choke Coil	
L404	4822 148 81143	OSC Transformer	
L405	4822 157 63035	Choke Coil	
L501	4822 148 81142	OSC Transformer	
QA01	4822 130 62632	Digital Transistor, Chip	UN2212X
QA21	4822 130 62632	Digital Transistor, Chip	UN2212X
QA41	4822 130 62637	Transistor, Chip	2SC3142(J3, J4)
QA43	4822 130 62637	Transistor, Chip	2SC3142(J3, J4)
QA44	4822 130 62636	Transistor, Chip	2SA1256(E4, E5)
QA45	4822 130 62637	Transistor, Chip	2SC3142(J3, J4)
QA46	4822 130 62636	Transistor, Chip	2SA1256(E4, E5)
QA47	4822 130 62632	Digital Transistor, Chip	UN2212X
QA81	4822 130 61098	Transistor, Chip	2SD874(Q, R)X
▲ Q31	4822 130 60111	Transistor	2SA1359(O, Y)
Q32	4822 130 43116	Transistor	2SC945L(P, K)-T
▲ Q51	4822 130 60111	Transistor	2SA1359(O, Y)
Q141	4822 130 61748	Transistor	2SC2668(O)E4
▲ Q241	4822 130 61748	Transistor	2SC2668(O)E4
Q341	4822 130 62635	Digital Transistor	UN4111TA
Q342	4822 130 43116	Transistor	2SC945L(P, K)-T
Q343	4822 130 60588	Digital Transistor	DTC114ES-TP
Q401	4822 130 60588	Digital Transistor	DTC114ES-TP
Q404	4822 130 60588	Digital Transistor	DTC114ES-TP
Q501	4822 130 62602	Transistor, Chip	2SC3052(E)X
Q502	4822 130 62602	Transistor, Chip	2SC3053(E)X
Q521	4822 130 62633	Digital Transistor	UN2213X
Q601	4822 130 62633	Digital Transistor	UN2213X
Q652	4822 130 62634	Digital Transistor	UN2111X
Q803	4822 130 62628	Digital Transistor	UN6116TA
Q804	4822 130 62628	Digital Transistor	UN6116TA
Q805	4822 130 62628	Digital Transistor	UN6116TA
Q806	4822 130 62628	Digital Transistor	UN6116TA
Q811	4822 130 62629	Digital Transistor	UN6111-T
Q812	4822 130 62631	Digital Transistor	UN6212-T
RM801	4822 130 82493	Photo Unit	GPIU500X
RY341	4822 280 20473	Relay	HD26-M-DC9V
▲ S02	4822 263 40058	Voltage Selector	
▲ S1	4822 276 13058	Push Switch, Power	
S801	4822 276 13059	Push Switch, Tact	
S802	4822 276 13061	Push Switch, Tact	
S803	4822 276 13061	Push Switch, Tact	
S804			
?	4822 276 13059	Push Switch, Tact	
S808			
S809	4822 263 13061	Push Switch, Tact	
S810	4822 276 13061	Push Switch, Tact	
			VMJ3016-003
			VMJ3016-003
			QMS6012-V01
			VMJ3016-004
			TOTX176
			TOTX176
			VMJ3016-002
			VQP1004-271TB
			ENZ5002-003BS
			VQP0015-101Z
			VQP0015-101Z
			VQP0015-470Z
			VQP0015-470Z
			VQP0015-470Z
			VQZ0044-002
			VQP0015-470Z
			VQP0015-470Z
			VQZ0046-002
			VQP0015-101Z
			VQZ0046-004

REF. DESIG.	PART NO.	DESCRIPTION	REMARKS
S811	4822 276 13059	Push Switch, Tact	QSP4H11-V16Z
S812	4822 276 13059	Push Switch, Tact	QSP4H11-V16Z
S813	4822 276 13061	Push Switch, Tact	QSP4H11-V13Z
S814	4822 276 13061	Push Switch, Tact	QSP4H11-V13Z
S815	4822 276 13059	Push Switch, Tact	QSP4H11-V16Z
S816	4822 276 21484	Slide Switch, Timer	QSS1A23-V05
S817	4822 276 21484	Slide Switch, Input	QSS1A23-V05
S818	4822 276 21485	Slide Switch, Rec Timer	QSS1A23-V07
VR301	4822 101 30751	Variable Resistor	QVDD14A-V01
VR371	4822 101 30752	Variable Resistor	QVDB66A-V01M
VR521	4822 101 30749	Trimming Resistor	QVZ3523-503AZ
X401	4822 242 73958	Crystal	18.4322MHz
X402	4822 242 73959	Crystal	16.9344MHz
			VCX5023-001
			VCX5016-934

11 Exploded View of Enclosure Assembly



• Enclosure Component Parts List

▲ Parts are safety assurance parts.
When replacing those parts, make sure to use the specified one.

REF. DESIG.	PART NO.	DESCRIPTION	REMARKS
4	4822 443 40987	Front Panel Assembly	VJC1956-001 /01B
8	4822 443 40991	Front Panel Assembly	VJC1956-002UL [U]
	4822 462 41383	Leg	VJF4035-001 /01B
	4822 462 41198	Leg	VJF4034-001 [U]
20	4822 502 13741	Screw, Bottom Cover	SXS13006CC
23	4822 502 30666	Screw, Lid	VKZ3004-003
24	4822 502 30667	Screw, Rear	SXST3006CC
26	4822 502 30669	Screw, F Panel	SXST3014CC
28	4822 502 13745	B.T. Screw (W/W) B3 x 6	DPSP3006CCH
29	4822 505 11095	Nut, Headphone Jack	VKZ4150-001
▲ 30	4822 146 21611	Power Transformer	VTP66C9-012B /01B
	4822 146 21609	Power Transformer	VTP66A9-011B [U]
31	4822 502 13745	B.T. Screw (W/W) B3 x 6	GBST3006CC
33	4822 401 11393	Bushing, AC Cord	QHS3876-162
34-1	4822 443 40988	Front Panel, Upper	VJC1957-001 /01B
34-1	4822 443 40992	Front Panel, Upper	VJC1957-002 [U]
34-2	4822 443 40989	Front Panel, Lower	JVC1958-001 /01B
34-2	4822 443 40993	Front Panel, Lower	JVC1958-002 [U]
35	4822 459 10943	Badge, MARANTZ	VJD5328-001 /01B
	4822 454 40107	Badge, PHILIPS	VJD5330-001 [U]
37	4822 443 63238	Lid, Tray	VJD3863-001 /01B
	4822 443 63239	Lid, Tray	VJD3863-002 [U]
39	4822 450 61666	Window	VJK3528-001 /01B
	4822 450 61667	Window	VJK3528-002 [U]
40	4822 410 61069	Button, Mecha	VXP2038-001 /01B
	4822 410 61075	Button, Mecha	VXP2038-002 [U]
41	4822 502 13746	B.T. Screw (W/W) B3 x 10	SDSF3010Z
44	4822 413 31573	Knob, Headphone Vol.	VXL4372-001
45	4822 410 61071	Button, Power	VXP5013-001 /01B
	4822 410 61076	Button, Power	VXP5013-002 [U]
49	4822 413 41634	Knob, Rec (R)	VXL3020-001
50	4822 413 41635	Knob, Rec (L)	VXL3019-001
60	4822 502 13747	F. Washer Screw F3 x 10	DPSP3010Z
▲ 62	4822 253 20145	Fuse	QMF51A2-1R25
	4822 253 30248	Fuse	QMF51U1-1R6
▲ 63	4822 070 31002	Fuse	QMF51A2-1R0
	4822 252 51114	Fuse	QMF51U1-1R25
▲ 71	4822 253 30363	Fuse	QMF51A2-R50 /01B
73	4822 450 61668	Window, Display	VJD5337-001
74	4822 450 61684	Window, RC	VJD5029-003
79	4822 358 50135	Link, Power Switch	VKS3499-002
81	4822 410 61072	Button, A Serch	VXP5012-001 /01B
	4822 410 61077	Button, A Serch	VXP5012-002 [U]
88	4822 413 31652	Knob, Timer	VXS4370-001
89	5322 530 70495	Flat Washer, S.	Q03091-1351
90	4822 410 61073	Button, Dummy (1)	VJD3864-001 /01B
	4822 410 61078	Button, Dummy (1)	VJD3864-002 [U]
91	4822 410 61074	Button, Dummy (2)	VJD3865-001 /01B
	4822 410 61079	Button, Dummy (2)	VJD3865-002 [U]
92	4822 410 61081	Button, Dummy (3)	VJD5329-001
93	4822 403 70334	Spacer, Headphone	VYSA2R4-010
Z001	4822 218 30589	Remote Commader, RM942	
Z002	4822 321 61095	Connective Cord	VMP0039-00D
Z901	4822 397 30232	Measuring Tape, MOT-0	
Z902	4822 397 30233	Measuring Tape, MOT-1	
Z903	4822 397 30235	Measuring Tape, MOT-2	
Z904	4822 397 30234	Measuring Tape, MOT-12	
Z905	4822 397 30231	Gauge (Torque), DT-13	
Z906	4822 395 50415	Driver (Biconvex), DR-V66	
Z907	4822 395 80391	Height Gauge, DA-300	
Z908	4822 397 30236	Measuring Tape, MOT-3S	
011T	4822 736 21028	User Manual /01B	
	4822 736 21029	User Manual [U]	[U]: For U.S.A.

• Enclosure Component Parts List

▲ Parts are safety assurance parts.
When replacing those parts, make sure to use the specified one.

REF. DESIG.	PART NO.	DESCRIPTION	REMARKS
4	4822 443 40995	Front Panel Assembly	VJC1948-001
8	4822 462 41198	Leg	VJF4034-001
20	4822 502 13741	Screw, Bottom Cover	SXST3006CC
23	4822 502 13744	Screw, Lid	VKZ3004-002
24	4822 502 30667	Screw, Rear	SXST3006CC
26	4822 502 30669	Screw, F Panel	SXST3014CC
28	4822 502 13745	B.T. Screw (W/W) B3 x 6	DPSP3006CCH
29	4822 505 11095	Nut, Headphone Jack	VKZ4150-001
▲ 30	4822 146 21611	Power Transformer	VTP66C9-012B /00R
	4822 146 21615	Power Transformer	VTP66C9-012BBS /05R
31	4822 502 13745	B.T. Screw (W/W) B3 x 6	GBST3006CC
33	4822 401 11393	Bushing, AC Cord	QHS3876-162 /00R
	4822 401 11402	Bushing, AC Cord	QHS3876-162BS /05R
34	4822 443 40995	Front Panel	VJC1951-001
35	4822 454 40107	Badge, PHILIPS	VJD5330-001
37	4822 443 63252	Lid, Tray	VJD5327-001
39	4822 450 61685	Window	VJK3527-001
40	4822 410 61103	Button, Mecha	VXP3406-001
41	4822 502 13746	B.T. Screw (W/W) B3 x 10	SDSF3010Z
42	4822 410 61104	Button, Stop/QC	VXP3407-001
43	4822 502 13746	B.T. Screw (W/W) B3 x 10	SDSF3010Z
44	4822 413 31651	Knob, Headphone Vol.	VXL4372-001
45	4822 410 61105	Button, Power	VXP5011-001
49	4822 413 41637	Knob, Rec (R)	VXL3018-001
50	4822 413 41638	Knob, Rec (L)	VXL3017-001
60	4822 502 13747	F. Washer Screw F3 x 10	DPSP3010Z
▲ 62	4822 253 20145	Fuse	QMF51A2-1R25 BS
▲ 63	4822 070 31002	Fuse	QMF51A2-1R0 BS
▲ 71	4822 253 30363	Fuse	QMF51A2-R50 BS
73	4822 450 61686	Window, Display	VJD4615-029
74	4822 450 61684	Window, RC	VJD5029-003
79	4822 358 50135	Link, Power Switch	VKS3499-002
81-1	4822 410 61106	Button, Serch (1)	VXP5016-001
81-2	4822 410 61107	Button, Serch (2)	VXP5017-001
88	4822 413 31652	Knob, Timer	VXS4370-001
Z001	4822 218 30594	Remote Commader, PM941	
Z002	4822 321 61095	Connective Cord	VMP0039-00D
Z901	4822 397 30232	Measuring Tape, MOT-0	
Z902	4822 397 30233	Measuring Tape, MOT-1	
Z903	4822 397 30235	Measuring Tape, MOT-2	
Z904	4822 397 30234	Measuring Tape, MOT-12	
Z905	4822 397 30231	Gauge (Torque), DT-13	
Z906	4822 395 50415	Driver (Biconvex), DR-V66	
Z907	4822 395 80391	Height Gauge, DA-300	
Z908	4822 397 30236	Measuring Tape, MOT-3S	
011T	4822 736 21037	User Manual	

12 Exploded View of Mechanism Assembly

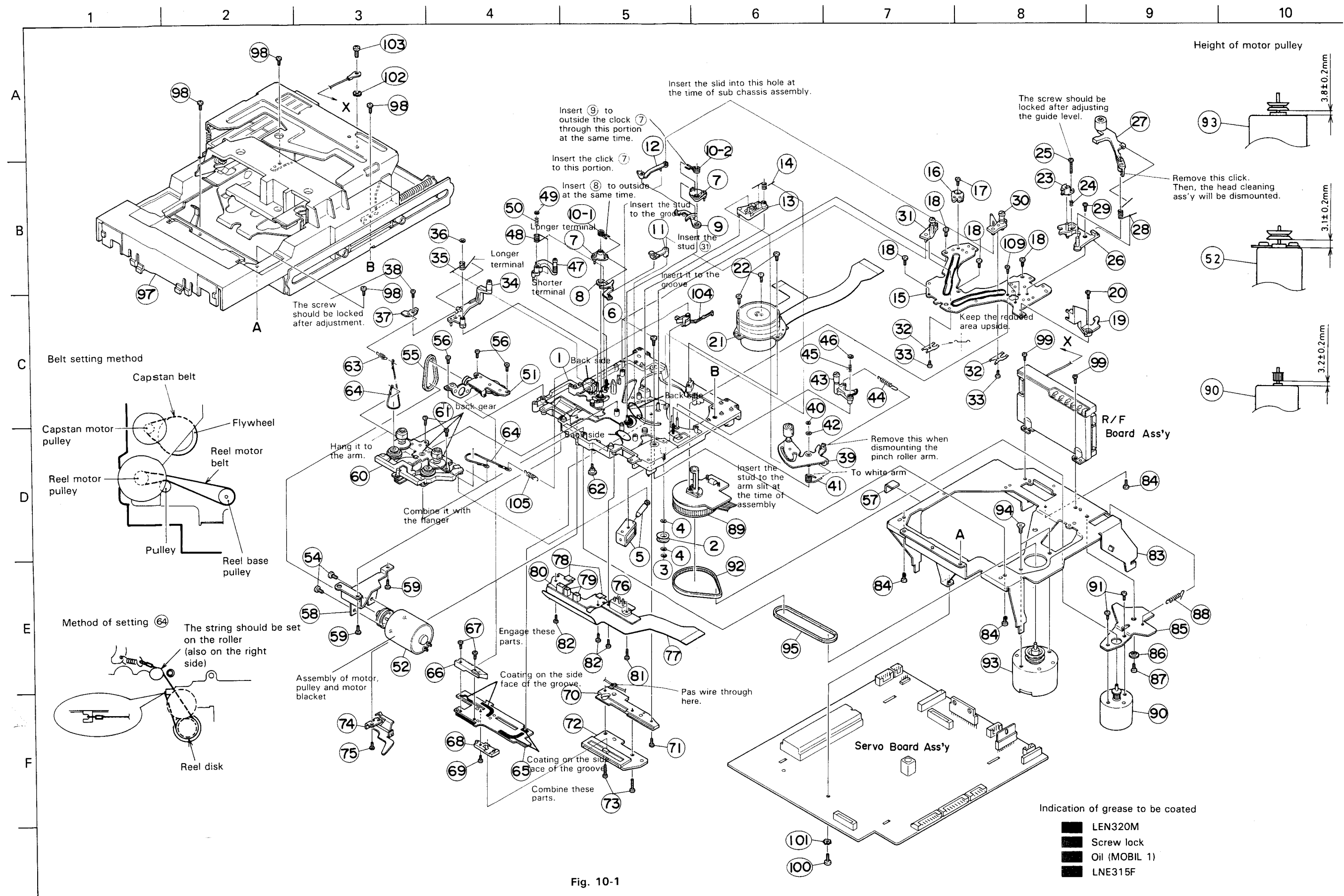


Fig. 10-1

REF. DESIG.	PART NO.	DESCRIPTION	REMARKS
2	4822 528 40335	Pulley	VKR4627-002
3	4822 532 52316	Washer, Pulley	WD1222525-4
4	4822 532 52317	Washer, Pulley	WFM173013
5	4822 281 50159	Solenoid Coil	VGP1501-001
6	4822 502 13741	Screw, Solenoid	SPSK2025M
10-1	4822 492 70851	Spring, Torsion	VKW4910-002
10-2	4822 492 70852	Spring, Torsion	VKW4831-002
14	4822 492 42527	Spring, Pinch	VKW3006-194
17	4822 502 30665	Screw	VKZ4539-001
18	4822 502 30665	Screw	VKZ4539-001
19	4822 403 70339	Cam, Lid Open	VKS3453-003
20	4822 502 30666	Screw, Lid Open	VKZ4539-004
21	4822 691 20648	Drum Assembly	SDA2305
22	4822 502 30667	Screw, Drum	VKZ4539-014
23	4822 403 70336	Guide, Tape	VKS5166-003
24	4822 492 52232	Spring, Guide	VKW3001-247
25	4822 502 30668	Screw, Guide	VKZ4539-006
27	4822 403 70341	Cleaner	VKS5164-00D
28	4822 492 42528	Spring, Cleaner	VKW4030-003
29	4822 502 30665	Screw	VKZ4539-001
30	4822 403 70337	Guide (T), Tape	VKZ3144-00
31	4822 403 70338	Guide (S), Tape	VKZ3147-00
32	4822 492 70856	Leaf Spring, Guide	VKY4536-005
33	4822 502 30669	Screw, Guide	VKZ4539-003
35	4822 492 42529	Spring, Arm	VKW4030-006
36	4822 532 52318	Washer, Arm	WFM123525
38	4822 502 30669	Screw, Lever	VKZ4539-003
40	4822 532 52319	Washer	WDL1222525-4
41	4822 492 42531	Spring	VKW4906-001
42	4822 532 52317	Washer	WFM173013
44	4822 492 33256	Spring	VKW4815-001
45	4822 492 52229	Spring	VKW3001-257
46	4822 532 52318	Washer	WFM123525
48	4822 492 42532	Spring, Lever	VKW4030-002
49	4822 532 52318	Washer	WFM123525
50	4822 492 52231	Spring, Lever	VKW3001-257
51	4822 691 20649	Control Board, Actuator	VKM3339-00B
52	4822 361 30342	D.C. Motor	MDH2B10
55	4822 358 31113	Belt, Drive	VKB3000-141
56	4822 502 30665	Screw, Motor	VKZ4539-001
59	4822 502 30665	Screw, Motor	VKZ4539-001
60	4822 528 10815	Reel Unit	VKL2544-00C
61	4822 502 30665	Screw, Reel	VKZ4539-001
62	4822 502 13742	Screw, Chassis	VKZ4357-001
63	4822 492 33257	Spring	VKW4837-001
64	4822 401 11392	String Assembly	VKZ4527-00B
65	4822 466 82789	Cam	VKL3991-006
66	4822 522 33042	Gear, Rack	VKS5102-005
67	4822 502 13748	Screw, Rack	SPSH1220M
68	4822 403 70342	Guide, Switch	VKS5103-003
69	4822 502 13748	Screw, Switch	SPSH1220M
71	4822 502 30665	Screw, Spacer	VKZ4539-001
72	4822 466 82791	Cam, Switch	VSUS002-002
73	4822 502 30668	Screw, Cam	VKZ4539-006
74	4822 403 70343	Control Board, Elevate	VK16389-00A
75	4822 502 30665	Screw, Elevate	VKZ4539-001
76	4822 276 13062	Push Switch, Rec Safety	VSH3102-001
77	4822 214 33278	P.W. Board Assembly, Hallic	VMW2710-001
78	4822 209 63692	IC, Hall	DN6851D
81	4822 502 30666	Screw, P.W. Board	VKZ4539-004

REF. DESIG.	PART NO.	DESCRIPTION	REMARKS
82	4822 502 30665	Screw, P.W. Board	VKZ4539-001
84	4822 502 30665	Screw, Bracket	VKZ4539-001
87	4822 502 30671	Screw, Bracket	VKZ4539-011
88	4822 492 33258	Spring, Bracket	VKW4010-018
89	4822 528 60384	Flywheel Assembly	M34118A
90	4822 361 30343	D.C. Motor	MDN-4RA2MY
91	4822 502 13743	Screw	SPSH2020M
92	4822 358 31114	Belt, Drive	VKB3002-004
93	4822 361 30344	D.C. Motor	MMN-6F2RA8
95	4822 358 31115	Belt, Drive	VKB3000-139
97	4822 443 40994	Tray Assembly	VKL1329-00C
98	4822 502 30671	Screw	VKZ4539-011
99	4822 502 30665	Screw	VKZ4539-001
101	4822 530 80271	T.L. Washer, OR	WBS2600N
102	4822 532 11388	T.L. Washer, OR	WBS3000N
104	4822 403 70346	Lever, Tension	VKS5320-001
105	4822 492 33259	Spring	VKW4010-017
109	4822 502 30665	Screw	VKZ4539-001